British Guiana.

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1 APP 1940

DIVISIONAL REPORTS

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE YEAR

1938.

GEORGETOWN, DEMERARA:
PRINTERS TO THE GOVERNMENT OF BRITISH GUIANA.
"THE ARGOSY" COMPANY, LIMITED.
1940.

DEPARTMENT OF AGRICULTURE.

ADMINISTRATION.

Director of Agriculture ... ...Prof. the Hon. J. Sydney Dash, B.Sc. (Agric.).
Deputy Director ... ...Vacant.

Clerical Staff.

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Registrar of Banks... .. ...W. G. Delph.
Class III. Clerks ... ...A. A. Thorne, Miss D. M. Terrill.
Probationers ... ...Miss M. Cheong, P. O. Jackson, S. A. Adams, Miss R. Delph, Miss S. Lord.
Librarian ... ...Miss V. Chan Choong.

RESEARCH BRANCH.

Botany and Plant Pathology.

Botanist-Plant Pathologist and Superintendent, Botanic Gardens:
E. B. Martyn, B.A., A.I.C.T.A.

Technical Assistant:
N. Persaud.

Chemistry.

Chemist:
D. W. Duthie, M.A., B.Sc., Ph.D., F.I.C.

Assistant Chemist:
C. L. C. Bourne.

Entomology.

Entomologist:
L. D. Cleare, F.R. Ent. S.

Technical Assistant:
C. Williams.

Rice.

Assistant Plant Breeder:
P. A. Chan-Choong, B.Sc., A.I.C.T.A.

Sugar.

(In co-operation with Sugar Producers).

Sugar Agronomist and Plant Breeder:
C. H. B. Williams, M.A., A.I.C.T.A., Dip. Agr.

Laboratory Assistants:
H. B. Singh.
A. V. Wan-Ping, Dip. Agr.

Statistical Clerk:
J. B. Bourne.

LIVESTOCK BRANCH.

Veterinary Surgeon:
H. A. Fraser, B.V.Sc.

FIELD BRANCH.

Agricultural Superintendents:
Berbice—A. A. Abraham.
Demerara, East—E. M. Peterkin.
Demerara, East Bank—H. D. Huggins M.Sc., Dip. Agr.
Demerara, West—E. G. Benson, B.Sc., A.I.C.T.A., Dip. Agr.
Essequibo—T. Bell, B.SA., A.I.C.T.A.

Assistant Agricultural Superintendent:
Berbice—E. M. Morgan.

Agricultural Instructors:
Botanic Gardens—H. A. Cole.
Demerara, East—C. C. Dowding, F.L.S., F.R.H.S.
Demerara, East—W. A. Bovell.
Demerara, East Bank—I. Dewar, (acting).
Essequibo—A. W. Sears.
North West District—L. E. McKinnon.

Agricultural Assistants:
Demerara, East—J. Indrobeharry.
Essequibo—H. B. France.

Sugar.

Field Manager (Central Station):
C. Cameron.

Field Assistants:
L. A. Forte.
B. A. McArthur.

METEOROLOGICAL BRANCH.

Technical Assistant:
D. D. Blackman.

Meteorological Assistant:
J. E. Isaacs.

RICE GRADING BRANCH.

Grading Inspector:
H. E. H. Gadd.

Technical Assistants:
G. L. Leitch.
R. R. Ross.

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Director of Agriculture, Chairman, *ex-officio.*
Deputy Director of Agriculture, Vice-Chairman, *ex officio.*

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Mr. S. Andries ... ...
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„ W. H. Richards ... ...

C.S.O. No. 2/31 H.

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DEPARTMENT OF AGRICULTURE

FOR THE YEAR

1938.

Printed by the Authority of His Excellency the Governor.

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DEPARTMENT OF AGRICULTURE.

REPORT ON THE BERBICE DIVISION FOR THE YEAR 1938.

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REPORT OF THE BERBICE DIVISION FOR THE YEAR 1938.

STAFF.

J. D. Gillespie, B.Sc. (Edin.)	...	Agricultural Superintendent.
E. M. Morgan ...	...	Assistant Agricultural Superintendent.
O. F. J. Churaman ...	...	Agricultural Instructor.
R. R. Ross ...	...	Technical Assistant.

2. J. D. Gillespie was granted vacation leave on August 24, and left the colony for Sierra Leone on promotion.

3. As a result the supervision of the district work between the Abary and Corentyne devolved on Mr. E. M. Morgan, Assistant Agricultural Superintendent, from August to the end of the year when other arrangements were made.

4. Mr. O. F. J. Churaman was appointed Agricultural Instructor in the month of August and assigned to the Lower Corentyne district, between Bramfield and No. 50.

5. Rice grading at Springlands and district work between No. 50 and Crabwood creek was carried out by Mr. R. R. Ross.

GENERAL.

6. The rainfall for the year was abnormal. Heavy rains continued incessantly from January until August, when dry weather supervened, and lasted until the end of the year, which is unusual, inasmuch as the November-December period is as a rule a comparatively wet one.

7. The abnormal rainfall had far-reaching effects, flood conditions prevailing in the entire county. The sugar and cattle industries suffered serious losses, while rice sustained a great reduction in acreage and provisions crops were completely thrown out.

8. During the year under review, the activities of the Department of Agriculture in this Division were varied and included :—

(1) Production of pure line padi.
(2) Experiments with padi varieties at Rosignol, Whim, and No. 70, Corentyne.
(3) Establishment of pure line seed farms and padi demonstration plots.
(4) Supervision of Whim and Macaw demonstration stations.
(5) Supervision of School Gardens.
(6) Chairmanship of Co-operative Credit Banks.
(7) General advisory work.

CROP CONDITIONS.

Sugar.

9. A considerable amount of extra work has had to be undertaken in drainage during the heavy rainy months.

10. It is regrettable to record the set-back this industry sustained from a series of strikes by every class of labour, the effect of which paralysed work on every sugar estate in the County.

11. The cost of cane production to farmers was high, due to poor yield. Abnormally heavy rainfall coupled with defective drainage, was largely responsible. The yields obtained were reported to be approximately 5 tons per acre.

Rice.

Autumn Crop.—No planting of this crop was possible in the Abary Creek and the savannah lands on the Corentyne, which were heavily flooded. Planting was

confined entirely to the coastal belts and despite unfavourable conditions which caused late planting, the crop was taken off in good time, resulting in remarkably high yields in one or two instances where as much as thirty to forty bags per acre were reported. The total acreage under this crop was 21,994 acres yielding an estimate of 444,253 (of 140 lb.) padi.

13. *Rice Grading.*—This work is exclusively confined to Springlands and the quantity graded and shipped for export during the year was 16,702 bags valued at $51,723.00.

Coconuts.

14. Conditions remain much the same in this cultivation as in previous years. There is however an increase in the extent of acreage which shows Eastern Berbice 2,591 acres and West Coast, Berbice, 1,375 acres.

15. The price of nuts has fallen very low during the period while that of copra and coconut oil has not improved. Production returns were 48,568 gallons of oil and 35,600 lb. copra.

16. Isolated cases of attack by the caterpillar Brassolis occurred periodically; the most serious of the attacks appeared in the Town of New Amsterdam. Control measures were done gratuitously by the Department of Agriculture, and met with general appreciation.

Ground Provisions.

17. The improvement made during the year 1937 in the cultivation of this crop was severely set back by continuous floods and the depredations of cattle in 1938. However, as the water abated, efforts were renewed and farmers were not slow slow in their activities. Suitable lands were secured in villages, and the sugar estates have given out an appreciably increased acreage.

18. Advantage was taken in cultivating much of the available sand reefs with garden vegetables, the result of which realised approximately 2,600 boxes of tomatoes of the general economic type, shipped to Georgetown, in addition to large quantities consumed locally.

19. On the West Coast, Berbice, several abandoned patches of land were planted with cassava and arrowroot; in spite of floods the arrowroot yielded satisfactorily and gave approximately 12,000 lb. of starch.

20. The return under ground provisions for 1938 was as follows:—

West Coast Berbice	...	621 acres.
Eastern Berbice	...	3,188 ,,

There is need for extension of ground provision cultivation, especially on the lower Corentyne area.

Citrus.

21. Interest is being maintained in keeping existing orchards cleaned and pruned. Unfortunately the cultivation is not being extended. Limes on the Creeklands Estate, Pln. Providence and the Berbice River continue to flourish. A return of the produce recorded was 4,813½ gallons of concentrated lime juice and 4,098 lb. lime oil. The acreage under citrus, including limes, was 619 acres.

Livestock.

22. Through the calls by the Dutch steamer at Springlands for cargo of cattle, pigs and fowls, for export to Trinidad and other West Indian Islands, there has been an increase in trade which is likely to benefit farmers, as these ships continue to call at least once every month.

23. The return showing exports during the year from Springlands wharf are as follows :—

Cattle	...	393 head	...	Value $	5,895.00
Calves	...	489 ,,	...	,,	2,445.00
Pigs	..	823 ,,	...	,,	3,292.00
Horses	...	3 ,,	...	,,	140.00
Donkeys	...	1 ,,	...	,,	6.00
Turkeys	...	6 ,,	...	,,	6.50
Ducks	...	254 ,,	...	,,	67.89
Fowls	...	4,833 ,,	...	,,	1,409.70
Eggs	...	1,427 doz.	...	,,	229.92

24. The return of livestock for the year 1938 is as follows :—

	West Coast Berbice.	Eastern Berbice.
Horses ...	... 295	... 201
Mules ...	... 33	.. 406
Donkeys ...	... 1,267	... 3,082
Cattle ...	... 16,874	.. 25,085
Sheep ...	... 8,678	... 13,306
Goats ...	... 2,895	... 3,591
Pigs ...	... 6,834	... 9,360

25. A bull pen and paddock has been erected at Whim, Corentyne. A red Poll bull " Kneep Pundit " arrived on October 13, in fit condition and was taken up to Whim on the same day. He has since retained his healthy condition and stock owners have evinced a keen interest by visiting the station regularly and bringing their animals for service.

DISTRICT WORK.

Sugar.

26. The cane trials conducted on the various estates in the County of Berbice during the year are dealt with in the report of the Cane Agronomist.

27. *Cane-Farming.*—This is exclusively confined to the back of the village of Rose Hall, Corentyne. The yield has been extremely poor last crop and on the advice of the management of Pln. Albion, it has been decided to flood-fallow the area ; the estate guaranteed to supply the necessary water.

28. A steady increase is noticeable in the quality of padi grown. Work in this connection was done with the assistance of farmers. Pure seed is given to a farmer who plants under the direct supervision of the Agricultural Officers. At harvesting, the padi is bought over at a price slightly above that of the market by the Department and stored for distribution.

Extension blocks were grown at Rosignol, West Coast, Berbice, Prospect (a section of Pln. Rose Hall, Canje) and Whim under severe circumstances during the year and results were poor. At the end of the year there were on hand for distribution in 1939 at the various bonds the following varieties :—

Demerara Creole	... ...	91 bags
Kalyaman	... ...	53 ,,
D99	... ...	41 ,,
		185 bags

29. *Variety Trials.*—There were seven transplanted trials carried out in this County, viz. : one at Rosignol, five at Whim, and one at No. 70, Corentyne. On account of continuous rains it was not possible to carry out further trials by broadcast.

30. *Rosignol Transplanted Trial.*—This was a Randomised Block; with ten varieties replicated five times and Demerara Creole as control. All the varieties grew luxuriously and tillered satisfactorily. Reaping was completed early in November with fair results.

31. *Whim.*—Five trials with ten varieties in each trial replicated five times, Demerara Creole and D79 being used as controls. Seedlings in the nurseries were attacked by caterpillars and the land had to be kept flooded, thus retarding the growth. Transplanting occupied a period of about 2 weeks, July 7 to 21.

32. These trials were very disappointing. In two of them, many of the plots failed to set grains; in another, conditions were not quite so bad, but even so a few of the plots gave no yield.

33. *No. 70, Corentyne.*—In this trial, the land having being planted with different varieties previously, it was observed at the time of flowering, that the plots were badly mixed.

Padi Competitions.

34. Four of these competitions were conducted during the year 1938, under similar conditions as in the previons years. They were keenly contested by farmers and the entrants were impressed with the work carried out at various stages. Roguing was a marked feature of these plots to maintain purity of the variety. At the final judging awards were made to the four best as follows:—

Golden Grove, West Coast Berbice—			
1st Prize	D. G. Baird ...	...	$15 00
2nd „	Charles Porter ...	...	10 00
3rd „	Aaron George ...	...	5 00
4th „	Jas. A. George ...	...	3 00
Cotton Tree—Rosignol—			
1st Prize	Charles Lamb ...	...	15 00
2nd „	Bouya ...	...	10 00
3rd „	Ali ...	...	5 00
4th „	Ramdan ...	...	3 00
Warren-Prospect, Corentyne—			
1st Prize	M. Y. Ishmael ...	...	15 00
2nd „	Alijohn ...	...	10 00
3rd „	C. Roberts ...	...	5 00
4th „	R. Cameron ...	...	3 00
No. 70 Corentyne—			
1st Prize	Doondoo ...	...	15 00
2nd „	Ragnauth ...	...	10 00
3rd „	Samaroo ...	...	5 00
4th „	Latchman ...	...	3 00

Agricultural Education.

35. *School Gardens:*—There are eleven aided gardens registered in this County. It is gratifying to report that all have done creditable work during the period. Attention was paid to the cultivation of various crops and rapid progress has been made in establishing some healthy plots of vegetables. The plots were kept clean, supplies of seed and plants distributed, and Officers of the Department paid regular visits.

It is worthy to note here the enthusiasm displayed by both teacher and pupils at the Friends garden. The lay-out has been carefully carried out under the direct supervision of the Head Teacher Mr. W. A. Fraser, on every occasion visits were made, distinctive progress was recorded. The plots presented a healthy appearance throughout the year and it is hoped that in the near future every other school will emulate this keen interest and splendid work.

CO-OPERATIVE CREDIT BANKS.

36. Seven Banks are now functioning. Three on the West Coast, Berbice, and four on the Corentyne Coast.

37. The Banks on the Corentyne are sound with the exception of Eversham where members depend exclusively on their farm produce to repay the loans; conditions are difficult there, which caused collections to be slow. The three remaining Credit Banks on the West Coast, Berbice are situated at Lichfield, Hopetown and Expectation. The last named has been able to declare a small dividend for the year. The recovery of loans has been difficult owing to the small size of the crop for some years.

PLANT PESTS AND DISEASES.

38. *Rice.*—In the nurseries, especially in the young stages, life eating caterpillars gave trouble. Plants have been somewhat retarded in growth but little damage on the whole was done.

39. *Coconuts.*—Attacks of Brassolis appeared in some places notably in New Amsterdam.

DISEASES OF ANIMALS.

40. *Cattle.*—An outbreak of Anthrax appeared among cattle on the Lower Corentyne. Assistance was given by the Veterinary Division and the Veterinary Surgeon visited regularly; effective measures were applied and checked the spread of the disease.

EXPERIMENT STATIONS.

Sub-Station Whim.

41. This Station continues to produce quite a variety of garden plants which yield fruit and seeds for distribution to farmers:

42. The following gives the distribution for the year:—

Onions (seedlings) ...	... 1,008
Boulangers (seedlings)...	... 480
,, (seeds) ...	... 2 lb. 4 oz.
Tomato (seedlings) ...	... 136
,, (seeds) ...	... 2 lb.
Cabbage (seedlings) ...	... 186
Papaw (fruit) ...	... 540
,, (seeds) ...	... 11 lb.
Tobacco (seedlings) ...	... 432
,, (seeds) ...	... 1 lb.
Eschallots ...	... 27½ lb.
Peas & Beans (Edible)...	... 220 lb.
Cauliflowers (seedlings)	... 36
Sweet Potato—tubers ...	... 780 lb.
Yams ...	... 47½ lb.

43. A small section on the southern side of the garden is planted with the Panama or Solo variety of papaw. Fruiting started about the latter part of 1937 and a good number were set and matured. The total distribution at the end of the year was 540 fruit and 11 pounds seed.

Sub-station Macaw.

46. During the year attention has been given to the oil palm cultivation at this station. The koker was found to be in disrepair as with the spring tide, water passes through the door and sides thereby causing temporary flooding. The palms at the northern end of the plot have made fair progress and have started to flower and set fruit, but the bunches are at present small. Weeding and thorough cleaning of the drains were done during the year. The palms on the southern side have not made corresponding progress; however, they are healthy and should in time improve. On account of the vote allocated to this station being limited more work was not possible.

MISCELLANEOUS.

47. *Visitors.*—His Excellency the Governor visted the County and took up residence at the Colony House, New Amsterdam.

48. The Director of Agriculture and the Deputy Director of Agriculture made tours of inspection on several occasions.

Other vistors were Mr. Parker, the Rice Milling Expert, who made tours of inspection, investigating the possibility of central factories; and the Meteorological Officer of the Department.

49. *Public Gardens.*—With a view to filling up existing holes on the lawns, the pond has been dug. The garden has been well maintained, reconstruction of the borders and the existing beds have been the main features.

50. *Demonstration Apiary.*—Only one apiary has been functioning well during the year, that at No. 63 Corentyne. It serves as a source of nucleus hives to the district.

51. *Acknowledgments.*—The Assistant Agricultural Superintendent records his appreciation of the co-operation rendered by the farming community, the sugar estate managers and the staff, in the carrying out of the activities in the County.

E. M. MORGAN,
Assistant Agricultural Superintendent,
Berbice.

January 15, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE EAST DEMERARA DIVISION FOR THE YEAR 1938.

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REPORT ON THE EAST DEMERARA DIVISION FOR THE YEAR 1938.

STAFF.

E. M. Peterkin —Agricultural Superintendent.
C. C. Dowding —Agricultural Instructor.
W. A. Bovell —Technical Assistant.

GENERAL.

Mr. E. M. Peterkin, Agricultural Superintendent, acted as Deputy Director of Agriculture from July 2 to December 31. The Central Rice Station was handed over to the supervision of the Agricultural Superintendent as from January 1. The Agricultural Superintendent was absent from the Colony on sick leave from February 27 to March 25.

2. Mr. W. A. Bovell, Technical Assistant, was transferred from the Mahaica-Abary District to the Rice Grading Division during the period June 13 to December 14, and Mr. G. L. Leitch was transferred from the Rice Grading Division to the District for the same period.

CROP CONDITIONS.

Sugar.

3. The continuous strikes on the sugar estates hindered the reaping of the farmers canes. The estates, owing to the strikes, reaped on many occasions only two or three days at a time ; this uncertainty prevented farmers from cutting their canes as they were afraid of having them left on the ground. In consequence, the canes became overripe and lost weight resulting in a money loss to the farmers.

4. The cane farmers at Plaisance petitioned Government for an aqueduct to facilitate their transportation to Plantation Ogle. Nothing has been definitely decided yet as Government intimated that if an aqueduct was put in it would have to form a charge against the general revenue of the village ; to this, the villagers other than cane farmers objected. Yields on the whole have been fair.

Rice.

5. The spring crop was small and the yields poor. For the autumn crop, in the Mahaica—Abary District, the planting was very late due to the continuous rains. There was a very small area planted in the creek areas as the water could not be got off the land, many of the Creek farmers, however, planted on the Coast. Reaping started in October and the yields were good. On the Lower East Coast the planting was a little late ; reaping started at the end of October. The yields in this area also were good.

Ground Provisions.

6. During the first half of the year the continuous rains damaged a large portion of the crop ; on the cessation of the rains every effort was made to prepare lands for planting and the position is now normal.

EXPERIMENT STATION, GEORGETOWN.

Ground Provisions and Vegetables.

7. *Bananas.*—The collection is as follows :—Apple, Red Fig, Jamaica, Sucrier, Cayenne, Gros Michel, Oronoque, Dwarf, Giant Fig, Congo, Lacatan, Large Fig, Small Fig, Sour Fig, Cocorite, Chan-A-Sue (N.W.D.), Martinique (N.W.D.), Red Jamaica, Lady's Finger, Almedo, Dacca, Rubra (India), Siam, Palembang, Ramkola, Celat, Serah (Indian Archipelago), Rajah (India), Martaban, Pisang-Su-Su (Singapore), Cinera Serampur, Martabanica, and I.C.T.A. 2. (Trinidad). The Dwarf and Gros Michel bananas planted in the flood-fallowed Section continued to fruit but sparsely, the bunches are usually four to five hands, weighing between ten to fifteen pounds.

8. *Plantains.*—The collection at present comprises, Apple, Surinam, Horse, Giant, Black, Pink, White, and Bluggoe.

9. *Cassava.*—The collection of varieties and types mentioned in the 1935 report is being kept up and added to as occasion permits; these were replanted in beds 1 & 2 Section C, South Field.

Mangoes.

10. The collection of grafted mangoes planted in South Field is making satisfactory growth though a few are still rather backward.

The collection now consists of the following:—

Julie	24
Mrs. White	3
Jamaica No. 11	5
Mrs. Dare	1
Graham	2
Pére Louis	3
Bombay Black (Essequibo)	3
Peach	4
Bangalore	1
D'or	3
Ceylon	1
Colonial Bank	1
Clementi	1
Divine	1
Peters or Bombay	1
Lorieau	1
Cambodiana	2
Cherie	2
Gordon	2
Bombay Purple	2

8 grafted Julie were planted on the Southern bed of the Fruit Dam.

Green Manures.

11. *Indigofera endecaphylla.*—This, as mentioned in the 1937 report, is undoubtedly the most satisfactory of all legumes tried as a cover crop for orchards, coconuts, etc. as well as being very useful as a fodder grown between Guatemala grass, etc. An extensive area of this is being grown and also very small areas of the following:—

Crotalaria spectablis, Crotalaria quinquifolia, C. usaramoensis, C. striata, C. sp., Indigofera hirsuta, I. sp., Dolichos hosei, Centrosema pubescens, Calapagonium mucunoides, Pueraria javanica, Tephrosia hookeriana, Phaseolus semi-erectus and *Sesbania speciosa.*

Pigeon Peas.

12. Trinidad White is the only variety now being cultivated; the continuous rains killed out most of the young plants and only a few are left.

Bamboos.

13. The row of bamboos on the northern boundary of the north-east and north-west fields flowered and seeded very prolificly during the early part of the year, after which the clumps started to die out, and have had to be removed as they die.

DISTRICT WORK.

Cane-farming.

14. The area under farmers canes, as in the census taken in 1937 in all cane-farming villages, was checked with the register and any changes entered. Farmers report that the yields in the old cane-farming areas are decreasing.

During the year the 1170 cuttings of P.O.J. 2878 were obtained from the Sugar Experiment Station and distributed free.

Rice.

15. The standard of purity has been maintained with the exception of a few areas. The quantities of seed distributed during 1938 are under :—

Seed grown in District Block—111 bags.
Seed grown at Central Rice Station—340 bags.

The number of seed farms established in the East Demerara was 53.

16. Five acres of pure line No. 79 and one acre of pure line Demerara Creole were grown at Plantation Nonpareil and yielded 170 bags for distribution in 1939.

Coconuts.

16. Brassolis attacks were severe at Plantation Park and the peasant proprietor lots at Fellowship; though present the attack was not as severe in other coconut areas in the Mahaicony District. The pruning of branches with nests, the collection of pupae and the breeding of parasites were carried out at Park, while the small proprietor merely pruned and collected pupae. Inspection gangs are kept on regularly on the larger estates. The outbreak is now well in hand, cultivations generally being better looked after than in previous years.

Plantains.

17. Beetles are still a serious pest in some areas ; this crop suffered from heavy and continous rains, but the position at the end af the year was normal.

Minor Crops.

18. *Bananas.*—Panama and Cercospora Leaf diseases were present at the Ogle back dam, but where bananas are grown mixed with other crops there is usually no disease.

19. *Ground Provisions.*—These suffered severely from the rains and many farmers substained heavy losses, the position is now normal. A larger area than usual was planted with sweet potatoes.

20. *Tomatoes.*—No improvement in the area grown or the quality of the fruit grown is to be reported.

21. *Onions.*—The seed sown at the end of 1937 to be planted out in 1938, suffered severely from the continous rains. The demand for seed at the end of this year was better than was expected.

22. *Peas and Beans.*—The area in these grown by individual farmers is small in spite of the free distribution of seed from Sub-Station Cecilia.

Lodge Allotments.

23. The irrigation and drainage trenches were allowed to get into such a disgraceful condition by the holders, that the Department of Agriculture was obliged to have then cleaned. There were at the end of this year 104 allotment holders.

School Gardens.

24. There are four aided School Gardens in this district :—St. Paul's C. of E., Plaisance, Friendship Methodist, Golden Grove Methodist, and Cane Grove Anglican. The Plaisance garden continues to be the best. Friendship garden, which a few years ago was of out standing quality has deteriorated. These gardens improved considerably towards the end of the year.

CROP PESTS.

25. *Sugar Cane.—Aphis* is still prevalent in the cane area at Beterverwagting.

26. *Rice.*—The nursery looper caterpillar was not a serious pest this year; occasionally sweeping had to be resorted to. The Ghandi bug did a little damage. Birds, as usual, were the worst pest. These can be divided into two classes, the one that attacks the padi in the milk stage the effect of which can be observed in the rice after milling as a dark discolouration at the tip of the grain, and the other that eats the mature grain.

27. *Coconuts.—Brassolis* was evident in the usual areas but there was a fairly oad infestation at Plantation Park and among the peasant proprietors at Fellowship, Mahaicony.

28. *Plantains.*—Beetles continue to be a serious pest.

29. *Bananas.*—Beetles, Panama and Cercospora Leaf diseases caused damage. Coushiants are present in the Mahaicony and Buxton areas.

CO-OPERATIVE CREDIT BANKS.

30. The Superintendent continued the Chairmanship of the Plaisance-Sparendaam, Beterverwagting-Triumph and the Buxton and Friendship Co-operative Credit Banks during the year; the Agricultural Instructor Mr. C. C. Dowding continued as Chairman of the Ann's Grove, Golden Grove and Victoria Banks during the same period.

31. Monthly meetings were held at each bank and visits were paid to deal with other business. The drive to collect long outstanding loans has been continued.

SUB-STATION CECILIA.

32. It is satisfactory to report that the general standard of cultivation in East Demerara has considerably improved of recent years which may, in a large measure, fairly be attributed to the influence of this demonstration plot.

34. The demand for planting material at the Station is on the increase. The number of visitors during the year was 778.

Tomatoes.

34. Plots of the following varieties were planted early in 1938:—Guernsey Champion and Marglobe.

The following table gives all data in connection with same:—

TABLE 1.

Variety.	Country of Origin.	Date Sown.	Date Transplanted.	Reaping Period.	No. of Stems.	Area Sq. ft.	Yield per Plot. lb.	Yield per Acre. lb.	Prevalence of Blossom-end rot.	Prevalence of Mosaic.
Marglobe ...	U.S.A.	31.1.38	3.3.38	19.5 to 16.7.38	2	288	12.0	1815	Slight	Very bad
Guernsey Champion	England	12.2.38	17.3.38	12.5 to 16.7.38	2	576	25.0	1889	Slight	Very bad

35. Another trial was carried out later in the year when some new varieties were tried as shown in Table 2.

TABLE 2.

Variety.	Country of Origin.	Date Sown.	Date Transplanted.	Reaping Period.	No. of Stems.	Area Sq. ft.	Yield per Plot. lb.	Yield per Acre. lb.	Prevalence of Blossom-end rot.	Prevalence of Mosaic.
Early Market ...	England	10.5.38	7.6.38	28.7 to 24.9.38	2	726	24.0	1440	Slight	Very bad
Marglobe ...	U.S.A.	10.5.38	7.6.38	5.8 to 24.9 38	2	242	6-0	1080	Slight	Very bad
Super Marglobe ...	U.S.A.	10.5.38	7.6.38	17.8 to 24.9.38	2	121	3.8	1260	Slight	Very bad
Guernsey Champion	England	10.5.38	7.6.38	2.8 to 24.9.38	2	484	22.0	1980	Slight	Very bad
Scarlet Topper ...	England	10 5.38	7.6.38	18.8 to 24.9.38	2	121	2.0	720	Slight	Very bad

Onions.

36. The onion seed sown at the end of 1937 was entirely destroyed by the heavy and continuous rains during the early part of the year.

37. The following table gives the results of Red Bombay, and Red Madras which were grown from bulbs :—

TABLE 5.

Variety.	Country of Origin.	Date Planted.	Date Reaped.	Area. sq. ft.	Yield per Plot. lb.	Prevalence of Trips.
Red Bombay ...	Montserrat ...	8. 2. 38	20. 5. 38	288	60.0	Slight
Red Madras ...	Montserrat ...	8. 2. 38	20. 5. 38	288	36.0	Slight

38.—*White Eschalott.*—A plot measuring 576 sq. ft. was planted on the 8.2.38 and gave 120 lb. or 9092 lb. per acre.

Soya Bean.

39. The following table shows the results obtained from duplicate plots of equal size :—

Variety.	Plot.	Date sown.	Date reaped.	Area. Sq. ft.	Yield per plot.	Yield per acre. lb.	Germination.
					lb. oz.		
White Caracas ...	1	8.1.38	18.4 to 9.5.38	148	4.12	1398	Very poor.
Manchu ...	2	8.1.38	4.4 to 11.4.38	148	5.0	1471	Fair.
Mandarin ...	3	8.1.38	31.3 to 4.4.38	148	6.8	1913	Fair.
Nanksoy 332 ...	4	8.1.38	31.3 to 4.4.38	148	6.4	1840	Fair.
Nanksoy 332 ...	5	8.1.38	31.3.38	148	7.2	2097	Good.
Wisconsin Black ...	6	8.1.38	13.4 to 15.4.38	148	4.12	1398	Poor.
Manchu ...	7	8.1.38	11.4.38	148	6.0	1766	Fair.
O.A.C. 211 ...	8	8.1.38	8.4.38	148	7.4	2134	Good.
O.A.C. 211 ...	9	8.1.38	13.4.38	148	3.12	1104	Fair.
Mandarin ...	10	8.1.38	5.4.38	148	5.4	1545	Fair.
Wisconsin Black ...	11	8.1.38	13.4 to 15.4.38	148	3.8	1030	Poor.
White Caracas ...	12	8.1.38	21.4 to 9.5.38	148	6.0	1766	Poor.

A variety of Soya Bean was received from the Imperial College of Tropical Agriculture, Trinidad, and an area of 1,896 square feet was planted on 4.4.38 and reaped on 19.7 to 5.8.38 and gave 70 lb. or 1608 lb. per acre.

Legumes.

40. The following are under cultivation at the Station for seed distribution :— Dwarf Bonavist, Bush Bonavist, Finger-shaped Bonavist, Waby Bean, Henderson's Bush Lima, Sinebone, Blackeye Peas, Cow Peas, Mung and Urid.

The following are some new varieties under trial :—

Cajanus	Cajan	L.	Pusa	type	69
,,	,,	,,	,,	,,	51
,,	,,	,,	,,	,,	16
,,	,,	,,	,,	,,	41
,,	,,	,,	,,	,,	15
,,	,,	,,	,,	,,	64
,,	,,	,,	,,	,,	80

Sword Bean ; Sheen Attapati mixed ; Split Peas ; Lobia Bean (red seeded) ; Pea, Yorkshire Hero ; Dwarf Bean, Golden Wax ; Dwarf Bean, Sutton's Premier.

Other Crops.

41. *Sweet Potato.*—There is a growing demand for cuttings of the Black Rock variety.

42. *Grapes.*—A good crop was reaped from the vines which were pruned on 22.6.38.

SEED DISTRIBUTION.

43. Plants, cuttings and seeds of field crops distributed from the Central Station alone during the period under review to farmers and others throughout the Colony are given in the following summary :—

	Seeds lb.	Seeds oz.	Cuttings	Plants.
Padi	63,140	00		
Peas and Beans ...	1	00		
Tobacco		11½		
Papaw		4		
Coconuts		...		181
Banana Suckers ...		...		492
Fodder Plants.				
Demerara Primrose ...		...	3,000	
Indigofera endecaphylla ...		...	39,000	
Guatemala Grass ...		8		
Guinea „ ...		8		
Wynne „ ...		8		
Para „ ...		8		

as well as small quantities of vegetable seeds.

44. The following plants, seeds and cuttings were distributed from Sub-station Cecilia during the year :—

	Seedlings	cuttings	Seeds lb.	Seeds oz.
Sweet potatoes ...	...	34,875	415	0
Yard Bean ...	...	...	8	10
Waby Bean ...	...	...	9	10
Henderson's Bush Lima	...	...	1	8
Lima Bean No. 3	...	...	2	12
Soya Bean	...	...	3	0
Bush Bonavist	...	...	5	6
Dwarf Bonavist ...	...	...	15	6
Finger shaped Bonavist	...	...	4	4
Black Eye Peas ...	...	...	15	0
Cow Peas ...	...	...	20	0
Sinebone ...	...	...	3	2
Urid ...	...	...	2	3
Mung ...	...	...	6	0
Peanuts ...	...	...	104	0
Tomato ...	900	...	1	4
Tobacco ...	1,080	...	...	12
Eschalott ...	...	...	67	0
Onion, Red Madras (bulbs)	...	...	24	0
„ „ Bombay „	...	...	65	0
Cucumber ...	...	...	...	8
Squash ...	...	...	...	10
Pumpkin ...	...	...	1	6
Boulanger ...	...	...	...	10
Ochroes ...	...	...	2	5
Melons, Water ...	...	...	1	4
„ Musk ...	...	...	1	8
Papaw ...	125	...	...	8
French Calalu ...	700	...	...	6
Indian Kale ...	800	...		
Grape Plants ...	...	48		

PLANT AND SEED INTRODUCTION.

45. The undermentioned seeds were received from abroad during the year:—

Padi—3 varieties—Dutch Guiana.
Papaw—4 varieties—Department of Agriculture, Mauritius.
Pigeon Peas—Cajanus—8 types, Department of Agriculture, Pusa, India.
Peas—Pisum—5 types—Department of Agriculture, Pusa, India.
Mango—6 Varieties—Puerto Rico.

E. M. PETERKIN,
Agricultural Superintendent,
East Demerara.

March, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE WEST DEMERARA DIVISION FOR THE YEAR 1938

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REPORT ON THE WEST DEMERARA DIVISION FOR THE YFAR 1938.

STAFF.

E. G. Benson, B.Sc., C.D.A., A.I.C.T.A. —Agricultural Superintendent.
A. A. Benn — —Foreman, Toevlugt Farm.

1. The Agricultural Superintendent, Mr. A. A. Abraham, was transferred from West Demerara to Essequibo in February, and Mr. E. G. Benson was transferred from that District in his place.

GENERAL.

2. The work of this Division has been as follows:—

(*a*) Pure line padi distribution; Agricultural Education; the collection of Census Returns and other data; General advisory work, and district routine.

(*b*) The production of pure line padi for seed distribution purposes, and the conducting of a variety trial at the Padi Experiment Station, Vreed-en-Hoop.

(*c*) The supervision of five School Gardens under the agricultural bias scheme.

(*d*) The Chairmanship of four Co-operative Credit Banks.

(*e*) The supervision of Toevlugt Farm.

(*f*) The supervision of a banana experiment at Middlesex, Canal No. 2.

CROP CONDITIONS.

3. *The Weather.*—The outstanding feature of this year was the abnormally heavy rainfall that prevailed from January to August. There was a total annual rainfall of 134.05 inches as compared with the average annual rainfall of 92·22 ins. for the county of Demerara.

4. *Floods.*—The Canals Polder area was flooded during the month of February. As usual, cassava especially and to a lesser extent the other root crops, suffered most and great losses were sustained. Plantain and banana cultivations were damaged, while the progress of citrus and other permanent crops was retarded. Pineapples suffered least.

Sugar.

5. The cultivation of the sugar estates was well maintained. As these areas are generally adequately drained, they suffered least from the abnormal weather conditions.

The reaped area and yield of canes including farmer's canes in this district during 1938 was 13,522 acres yielding 42,923 tons of sugar as compared with 14,327 acres yielding 39,855 tons of sugar in 1937.

The main varieties grown during the year were Diamond 10, P.O.J. 2878 and D. 625, the Diamond 10 variety predominating.

Rice.

6. Two crops of padi were grown and reaped around April and October. There was no very great loss by flooding in the field, but during periods of abnormal rainfall the reaping of both crops was retarded; and on account of excessive moisture the quality of padi was, generally speaking, below standard. The milling of padi into rice was also hampered on account of excessive rains.

7. The areas under padi were estimated as follows:—

	Volunteer Padi	Transplanted Padi
	acres.	acres.
Spring Crop ...	1,200	2,584
Autumn Crop ...	—	5,830

In the spring crop yields ranged from 8-10 bags per acre for volunteer padi and from 15-18 bags per acre for transplanted padi. In the autumn crop the yields of padi were, on the whole low and ranged from 19-24 bags per acre. Of the varieties or types grown Demerara Creole and Blue Stick predominated in accordance with following estimate made during the autumn crop :—

	Per cent. of Total Area.
Demerara Creole	53
Blue Stick	24
D 114	3
No. 79	3
Other types and Mixed Padi	17
	100

The purity of those areas under Demerara Creole padi was fairly well maintained.

Coffee.

8. No extension of this crop occurred during the year. Cultivations for the most part were either abandoned or only partially maintained on account of the low coffee prices that prevailed.

Citrus.

9. This crop was adversely affected by the weather, but as trees are generally planted on high ground few deaths occurred. Flowering and fruiting were diminished and poor crops were obtained. The budded citrus cultivation at Middlesex, Canal No. 2 looks well and is coming into bearing.

Ground Provisions.

10. These areas were especially affected by the abnormal rainfall. Losses occurred during the flooding of the Canals Polder in February. Heavy weather prevented efficient cultivation, and crops suffered from the excessive growth of weeds and poor tilth of the soil. There was a considerable reduction of yield. It was only towards the end of the year that farmers began to get their ground provision areas in order.

Pineapples.

11. The pineapple suffers least during a temporary flooding of the land. It is noted that an appreciable increase of this crop is occurring in the Canal No. 1 area especially, where it is intercultivated with ground provisions.

DISTRICT WORK.

Rice.

12. *Padi Extension.*—At the commencement of the autumn crop, the following quantities of seed padi were distributed :—

Demerara Creole ...	... 12,600 lb.	
D 114 ...	... 2,070 „	
Kalyaman ...	... 1,960 „	= 118¾ bags.

In addition, 9,800 lb. of D 114 not required by the district were supplied to the proprietor of Hamburg, Tiger Island at the request of the Agricultural Superintendent, Essequibo.

13. An effort was made to extend Demerara Creole padi throughout the district by distributing small quantities to as many of the farmers as possible. They were encouraged to conserve padi from their seed farms for future extension of the variety. Roguing of demarcated portions of cultivation or mass head selection directly before reaping were recommended to ensure purity. Proprietors and others in authority, together with the farmers, are continually warned against the cultivation of any padi not recommended by the Department of Agriculture. Such padi when obtained from unreliable source is nearly always impure. The grains are non-uniform in size and quality and therefore difficult to mill. Farmers seem willing

to accept Demerara Creole as a safe long grained type, but there are certain areas in which Blue Stick is preferred because it is easy to thresh and mill, and gives a good second crop. Unfortunately, the Blue Stick padi cultivated at the present time is not pure. The variety D114 which was previously introduced to farmers has not been extended because it is difficult to mill.

14. *Rice Grading.*—A few consigments of rice were sampled at Vreed-en-Hoop stelling on behalf of the Rice Grading Inspector.

Citrus.

15. About 50 citrus plants were budded at Pln. Anna Catherina, Canal No. 1, *in situ* at the request of the proprietors of the land.

Assessment of Damage to Cultivations.

16. At the request of the Public Works Department, assessments were made of damage done to cultivations by the dredge which operated in Canal No. 1. To this end periodic inspections were made by the Agricultural Superintendent.

Assistance to Farmers.

17. After the flooding of the Canals Polder area, a quantity of planting material was distributed to members of the Canal No. 2 and Canal No. 1 Farmers' Associations at their request.

Onion Seed.

18. A total of 64 ounces of onion seed was distributed to this district in November.

AGRICULTURAL EDUCATION.

School Gardens.

19. There are five aided school gardens in the District under the agricultural bias scheme as follows :—

1. Blankenburg Congregational School, West Coast.
2. Stewartville ,, ,, ,,
3. Bethel ,, ,, Canal No. 1.
4. Noitgedacht Canadian Mission School, Canal No. 1.
5. Vreed-en-Hoop School, West Bank.

The progress of the first four gardens was unsatisfactory since the weather was not favourable to their efficient cultivation until the latter part of the year. The garden at Vreed-en-Hoop was started in November. and has made excellent progress. By the end of the year all gardens were in fair order with the exception of the one situated at Noitgedacht. The site of this garden is unfavourable. Vegetable cultivations suffer severely from the ravages of cutting insects.

Farm Journals.

20. Farm Journals were distributed throughout the district quarterly. The publication is becoming increasingly popular with the farmers. With the casual sales of each copy, an attempt is made to secure annual subscriptions. In this district there were 183 regular subscribers during the year.

Co-operative Credit Banks.

21. There are four Co-operative Credit Banks in this District—one on the West Coast and three on the West Bank. Regular monthly meetings were held in all banks. There was a fair demand for loans throughout the year. Efforts were made in all Banks to collect long overdue amounts, and to this end special meetings were held.

EXPERIMENTAL WORK.

Padi Experiment Station, Vreed-en-Hoop.

22. The seed farm of the Department of Agriculture is situated on an 11 acre block of land at Vreed-en-Hoop where an autumn crop of padi was grown. The following cultivation was established ; —

8.44 acres of Demerara Creole padi for seed purposes
2.00 acres of D 221 padi for experimental purposes
.56 acre was devoted to a 9 x 5 randomised block

11.00 acres.

23. Seed of Demerara Creole and D 221 were sown on April 28 in nurseries. Transplanting was completed by June 2 and reaping occurred from October 12 to 31. The operation of reaping was considerably hindered by excessive rainfall.

24. The yields of this cultivation were as follows :—

		Lb.	Lb. per acre.
Demerara Creole	(8.44 acres)	22,820	2,704
D 221	(2 acres)	5,390	2,695

25. *Variety Trial :* The randomised block contained nine varieties in five replications. The varieties tested were : D 114, Jaisingh, D 99, D 110, D 116, D 115, Seymour, Demerara Creole and Kalyaman. Seeds were sown on May 6 and tranplanted during the week ending June 9. Reaping was finished on October 18. Flowering of all varieties with the exception of D 99 occurred in August. D 99 flowered in September. As the water supply to the experiment failed before all the grains of D 99 were fully matured, the yield of this variety was somewhat reduced.

The yield data of this experiment is as follows :—

Variety.	Lb. per acre.
D 114	3,424
Jaisingh	3,256
D 99	3,232
D 110	3,192
D 116	3,112
D 115	3,072
Seymour	2,872
D.C.	2,864
Kalyaman	2,816
Sig. Diff. P=.05	278.72

There was no significant difference between D114, Jaisingh, D 99 and D 110.

Banana Experiment, Middlesex, Canal No. 2.

26. In 1937 five acres were selected on Plantation Middlesex, Canal No. 2 and a Gros Michel banana cultivation consisting of 1,530 plants was established on this block of land in April. The cultivation, which begun to flower in February 1938 was considerably hampered by a severe attack of Cercospora leaf spot disease which first appeared in August 1937, followed by Panama Disease which appeared in September, 1937. The attack of leaf spot disease subsided, but at no time after its appearance were the plants entirely free from this disease.

27. As a remedial measure against Cercospora the cultivation was sprayed in January, May and June, 1938. This work was somewhat hampered on account of the wet weather. Bordeaux mixture of 2-2-40 and 4-4-40 strengths was used at the rate of about 200 gallons per acre. A portion of the cultivation was left unsprayed as a control. No difference between the sprayed and unsprayed portions of the cultivation was subsequently observed.

28. Panama Disease attacked the trees particularly about the time of flowering and fruiting. Throughout 1938 its ravages have been great. Whenever a stool was infected with Panama Disease it was cut down to ground level and the stump treated with gas oil. Vacant spots were supplied regularly three months after gas oil treatment. By the end of the year only 269 of the originally planted stools remained. Thus there was a loss of 82·4 per cent. of the cultivation.

29. The money expended upon the plot from 1937 to the end of 1938 amounted to $830.70. The yield of bananas and prices obtained were as follows :—

	No. of Bunches.	No, of Hands.	Weight (lb.)	Revenue (from spot sales)
	524	3,425	12,866	$ 87.68
Average ...	...	6-7	24½	.17

It is therefore obvious that the commercial cultivation of bananas was not practical at Middlesex.

Cassava Variety Trial, Toevlugt.

30. In collaboration with the Botanist, an experiment was laid down on Toevlugt farm with the view of testing the relative yields of eight locally grown varieties of bitter and sweet cassava.

31. The land was forked in March and the experiment planted in April. The eight varieties were established in five randomised blocks. The area from which yields will be reckoned amounts to 1/50th acre in each plot. The varieties tested were :—Sebew (bitter); London (Sweet); Butter Stick (sweet); Chinese Stick (sweet); Contention (bitter); Fine Leaf (bitter); Willie Baptiste (bitter); and Uncle Mac (sweet). This experiment is scheduled to be reaped early in 1939.

Toevlugt Farm.

32. In February 1937 an area of 6 acres was cleared, drained and planted with provision crops at Plo. Toevlugt, West Bank, Demerara. The area selected was typical of the surounding land. The object of this cultivation was to ascertain as far as possible the extent to which such a site might be utilised by the farmer in the growing of permanent, semi-permanent and temporary crops, and to find out the amount of labour and capital necessary for their production.

33. In 1938 an additional area of four acres was drained out of which 2½ acres were cleared. The unit of 10 acres was then made up as follows ;—

6 acres	—	Permanent, semi-permanent and temporary crops.
½ acre	—	Fodder grass.
1½ acres	—	Forest.
1⅙ acres	—	Cassava Experiment
⅚ acre	—	Fallow
10		

The originally cleared 6 acres of land were entirely devoted to arable farming and to the establishment of permanent crops. The permanent crops now being planted are :—oranges, ½ acre, grapefruit, ½ acre, coconuts 2 acres. Crops of plantains, bananas, tannias, sweet potatoes, cassava, pineapples, blackeye peas were established. A nursery shed was erected.

34. Like all ground provision areas, Toevlugt Farm suffered considerably from the abnormally high rainfall. It was not possible to keep the land free from weeds during that period. Neither was it possible to till the land with any degree of efficiency. Although the site was well drained and no flooding occurred yet the heavy clay soil was so compacted that on the whole poor yields were obtained from the crops reaped. Better cultivation was only possible towards the end of 1938.

35. No great difficulty has been experienced up to the present in the establishment and maintenance of such crops as bananas, plantains, cassava, coconuts, maize and citrus. The cultivation of vegetables was not successful, however. Moreover, it was not possible to grow such leguminous cover crops as bush bonavist, dwarf

bonavist and cow peas, as these were destroyed by cutting insects. The permament leguminous cover crop—*Indigofera endecaphylla*—was established under bananas from rooted cuttings planted into forked land during showers of rain. A fairly good cover was produced in about six months' time. This legume is eminently suited for the establishment under permanent crops, and to this end its growth has been started in the citrus beds.

MISCELLANEOUS.

Visitors.

36. His Excellency the Governor and the Director of Agriculture visited Toevlugt Farm on April 21. The Deputy Director of Agriculture and other members of the Department visited the district at frequent intervals.

Acknowledgment.

37. It is a pleasure to record the support and co-operation rendered by farmers and estate proprietors at all times during the period under review.

E. G. BENSON,
Agricultural Superintendent.

February 25, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE ESSEQUIBO DIVISION FOR THE YEAR 1938.

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REPORT ON THE ESSEQUEBO DIVISION FOR THE YEAR 1938.

STAFF.

A. A. Abraham	—Agricultural Superintendent.
A. W. Sears	—Agricultural Instructor.
H. B. France	—Agricultural Assistant.
A. S. Khan	—Clerk } Bush Lot Land Settlement.
N. Ali	—Clerk }

GENERAL.

2. The Agricultural Superintendent assumed charge of the Division in February, 1938. The Agricultural Assistant joined the staff in March.

3. The year was typically a rainy period. The rainfall recorded at Pln. Anna Regina was 111 inches 86 parts as compared with 83 inches66 parts for 1937. The reaping of the spring padi crop was materially handicapped and the padi was partly damaged during January-March rains, which affected adversely its price.

4. Although there was partial flooding of some areas during the year, the rains were beneficial in maintaining adequate supplies of water as there was danger of shortage for the autumn crop owing to an extensive breach in the Tapacooma Lake Conservancy which occurred earlier in the year.

5. Two significant events in connection with relieving the economic depression of the Essequebo Coast took place during the year in the visit of His Excellency The Governor, Sir Wilfrid Jackson, K.C.M.G., in February, and the visit of Mr. H. Parker, Manager of the Government Rice Mill, Perak, Malaya, in September. The purpose of the Governor's visit was to study means for the rehabilitation of the economic structure of the district. Mr. Parker's visit was to investigate the possibilities of a Central Rice Mill in the interest of the padi growers.

6. Of far-reaching importance in rice agriculture was the continued policy of the Agricultural Department in organizing private pure line padi seed farms along the coast and in the Wakenaam-Leguan-Hamburg island centres. This scheme was begun in 1934 when it was found that the circumscribed area of the Department's pure line padi seed farm of the Division was unable to cope with the requirements of the padi cultivators. Instructional propaganda work was, therefore, put into train for the establishment of these seed nurseries wherein each farmer propagates sufficient seed for the cultivation of his area. The continuity of the work is designed to promote concentrated and permanent interest in padi growers in the cultivation of pure line seed padi. The policy has been gradually fostered and brought to successful large scale achievement in 1938.

7. In March an extended tour of the farms and homestead in the Pomeroon River area was undertaken by the Agricultural Superintendent and a survey made of the condition of the coffee industry. Notwithstanding the low price level of agricultural produce the provision farms and coconut and coffee cultivations were well maintained. The inspection of the coffee cultivations revealed that much loss of crop was being sustained on account of the unremunerative low price of cured coffee ruling in 1938.

8. The Deputy Director and the Chemist visited the Division during the year to investigate the wilt disease of the coconut cultivations on the coast and the Pomeroon River section. A report on the incidence of the disease was made and circulated to the respective coconut growers accordingly.

9. The padi competitions conducted during the autumn crop covered a wider field for 1938 as against that of 1937. The greater number of entries for the year

under review was indicative of the intelligent interest the padi growers took in the cultivation of pure line seed padi during the season, influenced by the pure line padi scheme initiated by the Department of Agriculture.

10. An irrigation and drainage scheme for the Essequebo Coast was under consideration during the year. This scheme, when inaugurated would empolder new pasture areas for extended cattle rearing and would link up these new grazing agistments with the Government Cattle Breeding Centre established at La Belle Alliance where pedigree animals are kept for the improvement of cattle and control breeding.

11. In the establishment of the cattle breeding centre at La Belle Alliance unemployment was relieved to some extent for approximately three months. Labour was drawn from villages contiguous to Pln. Anna Regina. The force consisted of agricultural labourers, carpenters, masons, earth-burners and guttersmiths and unskilled labour.

CROP CONDITIONS.

Rice.

12. The chief varieties of padi grown in this Division for the year were Blue Stick, Demerara Creole and D.114. Owing to heavy rainfall during the reaping season, the harvest of the spring padi crop was unsatisfactory. The autumn padi crop was more successful as weather conditions were propitious during cultivation and harvesting. The yield of the autumn crop was good and was reported as being better than 1937 crop. The average yield per acre was 20 bags of 155 lb. In areas extending from Pln. Windsor Forest to Better Success the returns were better than from areas of the upper coast.

13. Uncertainty of export trade was created during the year owing to the temporary abolition of the Rice Marketing Board. When the Board resumed, export conditions were improved.

14. The price structure for padi of the autumn crop was very unstable. The price started at $1.44 per bag of 155 lb. As soon as the harvest was in full reaping the figure dropped to $1 per bag of the same weight. The price rose finally in November to $1.20.

15. The total area reaped was 20,385 acres with an estimated yield of 26,515 bags (of 140 lb.). The D114 variety, as usual, gave a higher return than the other varieties grown.

16. *Wakenaam-Leguan-Tiger Island.*—At these island centres the cultivation of pure line seed padi was at its peak during the autumn crop. This progress was due to the early programme of lectures given to padi growers at the beginning of the year at the different villages in the respective islands. At Leguan there was an appreciable increase of 200 acres as compared with the acreage under cultivation for 1937. The average yield of 25 bags of 140 lb. was maintained in 1938.

17. No pests or disease incidence in the padi cultivation in these islands occurred during the year.

Coconuts.

18. The position of the coconut industry in this Division as reported last year remained unchanged during the year. Copra prices although fluctuating did not rise remuneratively, consequently cultural methods were neglected.

19. Minute investigations of the incidence of Wilt Disease was made by the Chemist in April in connection with the coconut cultivations on the Coast and in the Pomeroon River. The Chemist issued a report on the cause of the disease and recommendations for its control which were circulated to the coconut cultivators.

Ground Provisions and Maize.

20. Notwithstanding the low price of foodstuffs, the provision farms in the Pomeroon section were efficiently maintained during the year. The cassava crop, however, was seriously affected owing to heavy rains during the year under review.

Coffee.

21. The coffee cultivation of the Pomeroon, despite continuous economic depression was in a well-kept condition during the year. A census taken in March of coffee farms under efficient farm management gave 845½ acres of coffee in condition capable of yielding 375 lb. per acre. Unfortunately, owing to prices being at low level during the year, approximately 64 per cent of berries was left ungathered.

Citrus.

22 With a view to cultivating citrus trees as a minor crop in this Division, three citrus nurseries for budding operations were established early in the year at Pln. Anna Regina, Pln. Affiance and Pln. Johanna Cecilia.

ANIMAL HUSBANDRY.

23. The cattle rearing industry of the Division was brought under better conditions and scientific breeding control by the establishment in 1938 of a well equipped breeding centre at the Department's agistment area at LaBelle Alliance. The pedigree bulls stationed here for service are two Red Polls and one Hereford. The bulls were imported from England in January, 1938.

DISTRICT WORK.

Rice

24. The main instructional work in connection with the rice industry in this Division was a campaign conducted during the spring and autumn crops relative to the organization of pure line seed padi farms. The scheme for the establishment of these nurseries for propagating pure seed padi had for its ultimate aim the maintenance of the purity of padi cultivated in the Division. The co-operation and concerted action in the past of the Millers and Padi Estate proprietors combined with the keen interest of the padi growers made possible the extension of this work during the year, which showed definite improvement and beneficial results in comparison with conditions which existed in previous years.

25. These nurseries form an inter-relationship between the Henrietta seed farm and the padi estates, whereby the Henrietta station issues pure line padi seed in various quantities to be cultivated by the farmer in these nurseries to raise sufficient seed for the requirements of his cultivation.

26. In the establishment of these seed farms the following quantities of pure line padi seed were distributed in 1938 :—

Blue Stick	...	...	5,848 lb.
Demerara Creole	...	...	7,545 „
D114	...	...	5,282 „
			18,675lb = 126¼ bags of 140 lb.

In addition 9,800 lb. of D114 was supplied from West Demerara to the proprietor of Hamburg, Tiger Island making a total distribution of 28,475 lb. equivalent to 203½ bags of 140 lb.

27. A manurial padi experiment with phosphatic manure was conducted at Pln. Affiance Field Columbia south under the direction of the Chemist during the autumn padi crop. The results of this experiment are dealt with in the Chemist's report.

28. The following is the number of seed farms established during the autumn crop : Essequibo Coast 82 ; Wakenaam 160 ; Leguan 140 ; Hamburg (Tiger Island, 54.

29. *Rice Grading and Padi Sampling.*—In accordance with the existing practice the following consignents of rice were sampled and examined provisionally on behalf of the Rice Grading Officer ;—

Classification.	No. of Bags.
Super	13,254
Extra No. 1	4,402
No 1	850
Super Broken ...	25
Total ...	18,531

as compared with 23,030 the previous year

AGRICULTURAL EDUCATION

School Gardens.

30. The progress of these gardens were seriously handicapped during the year owing to heavy rainy weather conditions.

Competitions.

31. There were two competitions scheduled to be held in 1938—(*a*) Padi and (*b*) Tobacco. The tobacco competition did not take place on account of bad weather experienced during the cultivation of the crop. The padi competitions, in view of the establishment of padi seed farms, embraced a wider field this year. The areas were divided into three sections. Supenaam to Maria's Lodge ; Johanna Cecilia to Cullen ; and Abram's Zuil to Better Hope each section being allotted four prizes. This method was organised with the view to creating interest in the cultivation of pure line seed. The farmers responded well. There were 505 entrants. The judging of these competitions, which was strictly applied to the seed farms was conducted with great care and attention, especially in Wakenaam and Leguan, where judging was somewhat difficult owing to the number of pure line seed farms involved.

32. These competitions were judged under the following conditions :—

"For the best Pure Line Padi Seed Farms and for the subsequent care taken of the seed harvested. The area established and the seed reserved to be sufficient to supply the growers' seed requirements for the following season's planting."

And in accordance with the following schedule ;—

	Points.
Farm.	
(1) Preparation of the nursery	40
(2) Attention given to roguing purity of padi ...	40
(3) Yield	20
Seed.	
(1) Quantity of seed reserved from the pure line seed farm ...	50
(2) Quantity of seed stored	20
(3) Method of storage	15
(4) Immunity from weevils and padi moth ...	15

33. The following tables give the result at the final judging :—

Section :

Supenaam to Maria's Lodge.

Prize Winner.	Address.	Total points gained.		
Ramnarayan	...Hibernia	200	1st Prize	$10.00
Sanichara	...Aurora	198	2nd ,,	5.00
Petamberappo	...Supenaam	180	3rd ,,	2.00
	Johanna Cecelia to Cullen.			
A. DeFreitas	...Perseverance	200	1st ,,	10.00
Acha	...Westland	198	2nd ,,	5.00

Section :

Abram's Zuil to Better Suecess.

Prize Winner.	Address.	Total points gained.			
Birball	...Better Success	200	1st	Prize	$10.00
Boodram	...Westbury	198	2nd	,,	5.00
Ramotar	...Bush Lot Land Settlement	190	3rd	,,	3.00
Sewa	...Anna Regina	190	3rd	,,	3.00
Ramnarine	...Bush Lot Land Settlement	180	4th	,,	2.00
	Tiger Island.				
Matai	...Hamburg	198	2nd	,,	3.00
Jumoon	...Hamburg	180	3rd	,,	2.00
	Wakenaam.				
B. Ramcharan	...Meer Zorg	200	1st	,,	15.00
Mohabir	...Maria's Pleasure	198	2nd	,,	10.00
A. E. Leung-Walker	...Arthurville	198	3rd	,,	5.00
A. Peters	...Zeelandia	190	4th	,,	3.00
	Leguan.				
E. E. White	...Canefield	200	1st	,,	15.00
J. G. Guyadeen	...Enterprise	198	2nd	,,	10.00
Mahash	...Phœnix	196	3rd	,,	5.00
Rameoran	...Tewsbury	190	4th	,,	3.00

Co-operative Credit Banks.

34. There are now two Credit Banks in the Essequibo District situated on the Coast. The Wakenaam and Leguan banks went out of business in 1937. Under the Committee of Management these banks concentrated their activities during the year in the collection of overdue loans and interest. In this connection satisfactory progress was made before the close of the year.

ANNA REGINA ESTATES.

35. These estates were under lease to the Honourable S. H. Seymour and Mr. Sase Narayan jointly for theyear 1938. The interests of the Agricultural Department were supervised by the Agricultural Superintendent. The general management of the estates by the lessees during the year was adequately maintained.

BUSH LOT LAND SETTLEMENT.

36. The following is a comparative statement showing the population, cultivation and indebtedness of settlers at the end of 1937 and 1938 :—

Period.	Population.	Area farmed (acres).	House Rent.	Land Rent.	Sanitation Rent.	Interest.	Advances.	Totals.
Decr. 1937 ...	176	264	$ 207.88	$ 544.10	$ 23.25	$ 133.96	$ 1,028.77	$ 1,937.96
,, 1938 ...	180	221½	237.42	644.53	29.97	141.69	1,270.30	2,323.91

Of the total sum under advances the sum of $407.82 represents money supplied to the settlers for the purchase of 18 ploughing steers which are secured to Government by promissory notes and branding. A total advance of $598.16 was made to settlers during 1938.

37. The cultivation of the Spring padi crop by the settlers was not successful owing to the rainy weather. The autumn crop was very satisfactory. The areas under cultivation for the year were :—

	Volunteer (Lameira crop). Acres.	Planted Acres.
Spring Crop 1938 ...	14.225	31.152
Autumn Crop 1938 ...	...	175.25

38. Both crops were advertised for tender and sold to the highest bidder. The following were the results :—

	Amount received by Settlers per bag.	No. of bags sold.
Spring crop 1938 ...	$1 44	63
Autumn crop 1938 ...	1 34	2,124

39. The sales were made through the Agricultural Superintendent at Pln. Anna Regina. From payments for padi, deductions were made and placed to the credit of the settlers' indebtedness to Government. The amount collected was $1,367.18.

40. The yearly routine of maintenance works to the settlement was carried out accordingly during the year. The extensive repairs required to settlers' houses reported in 1937 were undertaken as far as possible. Work in this connection, unfinished at the close of the year under review, was carried forward to 1939.

41. The kindergarten school in the settlement was well conducted during the year. His Excellency the Governor inspected Bush Lot Settlement in February and visited this infant school. His Excellency made the following entry in the school's log book :—

> "Visited school 28th February. For the circumstances of the Settlement "it is doing very useful work. I saw with special interest the atten- "tion given to maintaining a garden."

42. A home garden competition was held at Bush Lot Settlement in November. The plots were maintained very creditably during the year. Seventeen settlers entered for the competition. The following were the results of the competition :—

Prize-Winners.		Total Points.	
Manikram	—	90	1st Prize $5.00.
Seecharan	—	80	2nd ,, 4.00.
Ramotarsingh	—	80	2nd ,, 4.00.
Ramdial	—	60	3rd ,, 2.00.
Parbhoo	—	60	3rd ,, 2.00.
Sewlall	—	50	4th ,, 1.00.
Dhansingh	—	50	4th ,, 1.00.
Baliramsingh	...	50	4th ,, 1.00.

EXPERIMENT STATIONS.

Henrietta.

43. An extended variety trial of 41 varieties of padi was carried out at this station during the Autumn crop. The area occupied under these trials were four acres. The experiments consisted of two standard long grain trials, four standard medium grain trials, and one Indian variety trial.

44. The following table gives the summary of the experiments :—

Experiment 1.		Experiment 2.		Experiment 3.		Experiment 4.		Experiment 5.		Experiment 6.		Experiment 7.	
Variety.	Yield lb. per acre.	Variety.	Yield lb. per acre.	Variety.	Yield lb. per acre.	Variety.	Yield lb. per acre.	Variety.	Yield lb. per acre.	Variety.	Yield lb. per acre.	Variety.	Yield l per ac
D 99	4248	D 99	4212	D 99	4088	D 99	3476	D 99	4160	D 99	3480	1-1	302
D 114	4196	D 114	3928	D 94	3604	D 114	3260	D 257	3768	D 114	3212	D 114	295
Jaisingh	4076	Kalyaman	3700	D 114	3412	No. 79	2896	D 255	3724	19-37	3036	18-4	276
D 259	3884	Nickerie Patna	3604	D 109	3340	D 258	2856	D 247	3696	D 115	2764	Seymour S	273
Kalyaman	3780	D 221	3600	D 162	3264	D 221	2548	D 116	3644	17-37	2708	25-5	270
D.C.	3704	D.C.	3228	Unity	3172	D.C.	2516	D 250	3592	23-37	2696	Jaisingh	264
D 251	3560	D. 91	3224	D 221	3048	15-37	2484	D 256	3576	D 221	2660	17-3	259
D 254	3552	29-37	3140	D 108	3032	D 110	2296	D 114	3560	18-37	2600	22-2	246
D 253	3484	13-37	3104	D 193	2928	D 262	2120	D 246	3536	D.C.	2588	Ramjeas	235
Padi Berbice	3292	Seymour S	3008	D.C.	2908	D 261	1892	D.C.	3204	Blue Stick	2492	Sue	231
								D 221	3128				
Sig. Diff. P = .05	247	Sig. Diff. P = .0	208	Sig. Diff. P = .05	249	Sig. Diff. P = .05	288	Sig. Diff. P = .05	235	Sig. Diff. P = .05	223	Sig. Diff. P = .05	32

45. An examination of the results of these trials by the Plant Breeder shows that the following varieties can be discarded for future experiments :—

D.108	D.258	15/37	23/37
D.193	D.261	17/37	Padi Berbice.
D.221	D.262	18/37	Seymour.
D.251	13/37	19/37	

46. At the Wakenaam and Leguan Stations no variety trials were carried out during 1938. Demonstration plots and the Agricultural Department's seed farms were conducted at these centres during the autumn crop.

MISCELLANEOUS.

47. In addition to various reports and correspondence submitted during the year, a special report was submitted on the status of the coffee industry of the Pomeroon River and one on the possibilities of the development of the cattle industry under the proposed Irrigation and Drainage Scheme for the Essequibo Coast.

Wakenaam and Leguan.

48. The Agricultural Superintendent records his gratitude for the support given by the farming community and the padi estate proprietors and his appreciation of the co-operation rendered by the staff in the fulfilment of their duties.

A. A. ABRAHAM,
Agricultural Superintendent, Essequibo.

April 5, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE NORTH WEST DISTRICT FOR THE YEAR 1938.

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REPORT ON THE NORTH WEST DISTRICT FOR THE YEAR 1938

STAFF.

L. E. McKinnon—Agricultural Instructor.

GENERAL.

Very heavy rains were experienced in the district during the year, and were unfavourable for agriculture in general. The rains started in January and continued until August. There was then a break in September, but heavy rains again started in October and continued on to December. During the months of February, March and October, which are usually the driest during the year in this district, rain fell almost continuously. The total rainfall for the year was 132.05 inches.

2. The heavy rains at the time when the citrus trees were flowering destroyed much of the blossom, resulting in a very poor crop. Also the farmers have suffered financial loss by not being able to burn and plant newly cleared areas, which areas had again to be cleared for the October season, when however rain once more prevented planting. For this same reason there was a scarcity of bitter cassava among the Aboriginal Indians who therefore turned for employment only to such farmers as had any. Farmers in the Waini and at the mouth of the Moruca River have lost most of their crops during the year, through floods caused by the continuous rainfall.

3. Visits were paid to all the farms in the district and advice given to farmers on spacing of plants, drainage, pruning, methods of improving the quality of coffee and other farm products. The mileage travelled during the year was 3,733. The Agricultural Instructor travelled to Georgetown on June 23, and visited Head Office and the Botanic Garden's Nursery. The Instructor was again absent from the district on two weeks casual leave from December 23.

4. Labour shortage affected the large grant holders during the year. The prices obtained for corn and ground provisions during the year were considered fair, but only a few farmers have benefited, as others were unable to plant owing to weather conditions. The price for cured coffee took an upward tendency during the month of November and continued to the end of the year.

5. One farmer in the Aruka who started rearing cattle during 1936 has made some progress, and now has a fair number of healthy cattle and sheep. A few farmers in the Aruka and Koriabo are becoming interested in pigs and poultry rearing. Orders have been placed with the Department for these, and will be supplied within a short time. The owners of bee hives in the district have made good progress during the year.

CROP CONDITIONS.

Coffee.

6. The acreage under this crop is 1,005 acres a decrease of 584 acres, since the previous year. One estate of 360 acres which was in a semi-abandoned state has now been abandoned entirely. The coffee areas in the Waini have also been abandoned; at present 194 acres are in a semi-derelict condition. If such areas are not taken in hand at once, they will, within a short time, go out of cultivation altogether. The average yield per acre continued to be 300 to 400 pounds, and the majority of the farmers have produced cured coffee of good quality during the year.

Coconuts.

7. The acreage under this crop is 171 acres, a decrease of $82\frac{3}{4}$ acres since the previous year. The plants at the mouth of the Moruca River have suffered from constant flooding and 43 acres have died out; older trees in other sections of the

districts have also died. The young plants growing at the Wanaina and Maridowa hills are looking promising.

Citrus.

8. This crop was well maintained during the year. The acreage under cultivation is 85½ acres, an increase of 8¼ acres since last year. The majority of budded plants supplied to farmers have made good progress during the year.

9. The prices for grapefruit and oranges during the early part of the year were very poor, but as the heavy rains during April-May destroyed a great deal of the blossom, this resulted in a poor 1938-1939 crop, and the shortage has caused prices to increase. During November and December the price for grapefruit was $2.40-$2.88 per 100 and that of oranges $1.44 to $1.68 per 100.

10. *Limes.*—The cultivations in the various sections in the district have made satisfactory progress during the year. The acreage under cultivation is 191½ acres, an increase of 5¾ acres since last year. Further areas were cleared during the year for extension, and orders have been placed at the station for the supply of budded plants. A quantity of St. Lucia smooth skin limes are being budded for distribution.

11. The proprietor of the Mabaruma Lime Factory continues to purchase all the limes in the district. The output of raw lime juice was 16,000 gallons and that of oil of limes 90 gallons, a decrease of 12,000 gallons raw lime juice and 116 gallons of oil of limes. This shortage was again due to the heavy rains during the flowering period, and consequent loss of fruit.

12. A further trial shipment of 20 lugs of green limes was sent from this district, through the Department, to Canada, but the result was not encouraging, and the price received did not make the venture remunerative.

Cacao.

13. The acreage under cultivation is 164¾ acres—an increase of 3½ acres since last year. Special attention was paid to this cultivation during the year, and I am glad to be able to report that in the majority of cases, farmers have carried out the advice given by the Agricultural Instructor with regard to pruning and the selection of pods for planting.

Ginger.

14. The area under this crop was maintained during the year, efforts are being made to get farmers who are interested to cure this product so as not to glut the market with green ginger. A start was made, but owing to the rains and lack of sun for drying the trials were not successful. Further attempts will be made with the next crop, if the weather for drying is suitable.

Ground Provisions.

15. New areas were cleared and empoldered during the year but no planting of these areas were carried out owing to the rains. Only a small number of farmers who had provision lands from the previous year could plant. This has resulted in a decreased acreage. Prices for ground provisions were fair throughout the year but only a few farmers benefited. Very few sweet potatoes were shipped from the Moruca district during the year, owing to the continuous flooding by water from the Savannah. The areas under cassava also decreased as noted in paragraph 2.

HOSORORO EXPERIMENT STATION.

General.

16. The Station was well maintained during the year and the citrus orchard continued to be of interest to farmers and other visitors. The Government Botanist accompanied by the Chemist visited the Station at the end of April and inspected the various sections under cultivation. Other visitors to the Station were the

District Commissioner, The Director of Public Works, Justice and Mrs. Langley and Drs. Wharton and Ramdeholl, besides farmers in the district.

Citrus.

17. The area under budded Citrus was kept in good condition during the year, and 200 Grapefruit and 70 Orange plants fruited. The Botanic Gardens Marsh Grapefruit in the first field are for the most part situated in a pocket on the hill-side where the soil is fairly deep and for this reason have always made the best growth. The trees have spread so that they meet, and this factor, together with a crop of *Calapogonium mucunoides* that covers much of the ground, keeps weeds in abeyance. trees have however a tendency to too much wood, and to try to overcome this, heavy pruning was carried out in May, under the direction of the Botanist. The chief object was to open up the centre of the trees, which in many cases was very necessary. Also, a number of the trees were found to bear fruit with a good deal of seed in it. This may be due to the budwood from which they are propagated, or to the proximity of a good many other varieties of citrus, but to offset the former possibility a number of the trees with markedly seedy fruit were cut back and top worked (by crown grafting) with scions from a Florida Marsh seedless tree in the orchard.

18. The Citrus in the remainder of the orchard are for the most part on poor and rocky soil, and a dressing of artificial manure was given to 67 Grapefruit and Orange plants, including some of the Trinidad oranges West of the Mahagony belt, a number of the Duncan Grapefruit and the miscellaneous citrus varieties in the South West Field. The Duncan Grapefruit trees treated were making good vegetative growth and it is intended in this case to note the effect of the dressing on the quantity and quality of the fruit. In the other cases the trees were stunted and poorly developed and it is hoped that the dressing will give them rather more vigorous growth. The dressing, which consisted of 2 lb Potash, 1 lb Super Phosphate, and ½ lb. Sulphate of ammonia per tree, was applied in June and again in December.

19. Twelve smooth skinned Lemon plants propagated from budwood obtained from Surinam and raised on Sour orange stock were added to the miscellaneous collection of citrus in the South West Field.

Budded and Seedling Limes.

20. In the experimental area of 2½ acres budded and 2½ acres seedling limes some of the plants were pruned. The crop was a very poor one due to heavy rains during the flowering period.

Pears.

21. The Pears for the most part made poor growth, being planted on stony soil. The variety R. C. Lord however (a local selection) though bearing poor quality fruit, has made fairly vigorous growth, and a few of these trees were therefore cut back and successfully top worked by inarching with scions taken from "Pollock" and "Rudder" trees. Attempts at cleft grafting failed. To try and stimulate growth eighteen of the Pear trees were given the same dressing of artificials as the citrus in June and December.

Miscellaneous.

22. *Fish Poisons.*—No cultural work was carried out on the Haiaris during the year. The plants originally set out under shade are now climbing on the forest trees surrounding them and the stems are already in many cases one or two inches thick. Twelve cuttings of *Derris elliptica* were received from the Botanic Gardens and planted in laterite soil on the hill slope below the rubber house in October. Eight cuttings have caught but they are making slow growth.

23. *Black Pepper* (*Piper nigrum*).—The plants growing at the foot of the hill have suffered from continuous rains, they are situated not far from the creek and

during a heavy downpour the creek overflowed and flooded the area, causing them to shed their leaves. They have now recovered and have started to make fresh growth,

24. *Tung Oil (Aleurites montana).* These plants have made some progress during the year, two of the plants have flowered and are now fruiting.

25. *Oil Palms.*—Some of these plants are fruiting, but a number are showing signs of dying, probable as their roots get down to the water level in the pegasse flat where they are being tried.

26. *Citronella Grass.*—During the year distilling experiments were carried out with the older grass growing at the Station, but the quality of the oil was not satisfactory. An area of 138 sq. rods was planted on the pegasse during May, 1938, so as to carry out further experiments, and the first cutting was done during November, six months after planting, but the quality of the oil again proved unsatisfactory. Further trials will be carried out however, and a small area has been planted with this grass on the laterite.

27. *Chalmoogra Oil* (*Hydnocarpus anthelminticus*).—One plant bore a few seeds, which have been collected and sown.

28. *Historical Cacao.*—The plot has been tended during the year, and pods sent to the Botanic Gardens for seed purposes.

29. *Ginger Lily.*—The area under this crop is now well established, and additional cross drains were dug. It is apparent however, that the crop does not grow very well under "artificial" conditions and does not attain the size found sometimes on the margin of tidal creeks.

WAUNA SUB-STATION.

General.

30. This Station continued to be maintained by the watchman alone, the coconuts and citrus receiving the most attention. The rainfall recorded there for the year was 133.68 inches.

Citrus.

31. During the year 15 Grapefruit and 29 Orange plants fruited. The Navel oranges are very poor, the fruits being quite dry.

32. *Limes.*—The budded limes gave little or no crop during the year, owing to the continuous rain at the time of flowering.

Coconuts.

33. St. Lucia Dwarf. One plant fruited during the year, but the nuts are not yet ready for seed purposes. The other plants are still backward.

Seeds from Essequibo. These have made slow growth during the year.

Oil Palms.

34. The majority of these plants have made good progress during the year and a good number are bearing fruit. This crop seems able to hold its own on the very poor sandy soil of the station and to be suited to the environment.

Haiari.

35. The black and white Haiaris continue to make satisfactory progress, and those originally planted under shade are now climbing on the forest trees around them.

Pests and Diseases.

36. *Sclerotium coffeicolum* Stahel. This disease made its appearance during the month of September on the younger coffee cultivations in the Barima and Aruka districts. Farmers as far as possible collected infected material and destroyed it to try and prevent further spread of the disease.

37. *Hard Back Beetles* (Cockles).—This pest did very little damage during the year. Only two farmers reported the presence of cockles on their farms in the Barima district and the damage was neglible. The heavy rains during the year helped to keep away this pest.

38. *Coushi Ants.*—This pest was as usual very troublesome, especially on the younger citrus and cacao cultivations. Small quantities of carbon bisulphide were supplied from the Station to farmers.

DISTRIBUTION OF SEEDS AND PLANTS.

39. The following were sent to the Botanic Gardens during the year :—

Sour Orange seedlings	... ...	2 boxes
Sour Orange	... ...	28,400 seeds
Limes	... ...	8,400 „
„	... ...	3 plants
Grapefruit (Marsh)	... ...	150 buds
Oranges (Several varieties)	... ...	590 „
Pear Scions (2 varieties)	... ...	450 cuttings

40. The following were distributed to farmers in the district :—

Nutmeg		25 plants
Carambola		1 plant
Budded grapefruit		6 plants
Budded oranges		29 „
Cacao		418 „
„		57 pods

L. E. McKINNON,
Agricultural Instructor.

February 9, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE RICE EXPERIMENT STATION FOR THE YEAR 1938.

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REPORT ON THE RICE EXPERIMENT STATION FOR THE YEAR 1938.

STAFF.

C. H. B. Williams, M.A., A.I.C.T.A., Dip. Agr. —Sugar Agronomist and Plant Breeder.
P. A. Chan-Choong, B.Sc., A.I.C.T.A. —Assistant Plant Breeder.
J. Indrobeharry —Agricultural Assistant.

Mr. Williams was appointed Plant Breeder in addition to his substantive duties as Sugar Agronomist as from January 1, 1938. Mr. Chan-Choong had been appointed Assistant Plant Breeder previously, *i.e.*, from July 22, 1937.

2. No report on the plant breeding work with rice, etc., has been issued since that of Mr. L. E. W. Codd for 1935. This officer proceeded on leave on July 7, 1936, and there was a hiatus in these activities until the appointments enumerated in para. 1 had been made. Readers are, however, referred to *The Agricultural Journal of British Guiana*, VII., p. 115, VIII, p. 41 and IX, p. 82 for some account of what had taken place up to the end of 1937.

3. Mr. E. M. Peterkin, Agricultural Superintendent, East Demerara, had charge of the progeny rows, etc., from the time of Mr. Codd's departure until Mr. Chan Choong took over after the planting of the 1937 Autumn Crop.

PURE LINES.

4. The additions to progeny rows since the last report have been :—

1936—3 varieties from Sierra Leone (see *Ag. Journ.*, IX, p.95),
1937–40 varieties selected locally (*Ag. Journ.*, IX, pp.96—97),
1938—6 varieties from India (see Table VII of this Report),
5 varieties from Brazil (see Table VII of this Report),
93 varieties selected locally (see Table VII of this Report).

5. *The varieties discarded* in 1937 were listed in *The Agricultural Journal*, IX, p. 92, and Table VI of this Report shows all the varieties recorded as being discarded up to the end of 1938.

6. *The varieties under observation* at the end of 1938, appear in Table VII.

7. *The nomenclature of the varieties* calls for more uniformity and an effort is made in Tables I and II to clarify the situation. In the past, varieties have usually been given a Demerara serial number such as D. 118 or D. 259, but in some cases the local or foreign names were retained (*e.g.* Nickerie Patna, Karimganj) and there was no fixed procedure.

8. In the list of discarded varieties (Table I), the rices are listed by the names or numbers by which they were known, and by both in cases where a serial number was given to a named variety. In the case of the varieties still under observation or test (Table II), and of those to come in the future, it is proposed to adopt the following procedure ;—

(*a*) Foreign varieties will retain the names or numbers under which they are received ;

(*b*) Local selections which are already known by a name will retain the name already in use ;

(*c*) Local selections made prior to 1937 will be denoted by the Demerara serial numbers already given to them ;

(*d*) Local selections made in and after 1937 will be denoted by a Demerara serial number with two figures following to indicate the year of selection (*e.g.* 30/39, 30/40).

TABLE I. RICE VARIETIES DISCARDED UP TO DECEMBER, 1938.

Serial No.	Name.	Origin.	Serial No.	Name.	Origin.
	McKenzie Small ...	Obscure	D. 98	...	Georgetown Station
	Blue Rose ...	,,	D. 100	...	,, ,,
	H 6 ...	,,		Motka ...	Fiji
	H 7 ...	,,		OK Shot ...	Mandalay
	No. 75 ...	,,		Phungmalaung ...	,,
	No. 76 ...	,,		Zenobia ...	,,
	No. 77 ...	,,		Bommadeva ...	,,
	No. 78 ...	,,		Theikpan ...	,,
	Essequibo Barley ...	Essequibo	D. 108	...	La Jalousie, W.C.D.
	Chinese Barley ...	,,	D. 111	...	,, ,,
	Early Prolific ...	California, U-S.A.	D. 112	...	,, ,,
	Blue Rose ...	,, ,,	D. 113	...	,, ,,
	Lady Wright ...	,, ,,	D. 115	...	,, ,,
	Carolina ...	,, ,,		Jajai 77 ...	Sind, India
	Siam ...	Trinidad		Kangni 27 ...	,, ,,
	H 6 ...	,,		Prong 36 ...	,, ,,
	Kalai Aman ...	,,		Torh ...	,, ,,
	Creole ...	,,		Caloro 316 ...	Yanco, N.S. Wales
	A.H.C. Variant 1 ...	,,		Colusa 180 ...	,, ,,
	A.E.B. 35 ...	Madras, India		Basmati 370 ...	Punjab, India
	A.E.B. 65 ...	,, ,,		Hansraj 62/26 ...	,, ,,
	A.E.B. 92 ...	,, ,,		Jhona 349 ...	,, ,,
	A.D.T. 2 ...	,, ,,		Mushkan 7 ...	,, ,,
	A.D.T. 3 ...	,, ,,		Mushkan 41 ...	,, ,,
	A.D.T. 6 ...	,, ,,		Magoi 257 ...	,, ,,
	Atragada ...	Madras, India		Palman 46 ...	,, ,,
	Konamani ...	,, ,,		Basanta bahar ..	Assam, India
	Swarnalu ...	,, ,,		Basmati As 3 ...	,, ,,
	Basangi ...	,, ,,		Kataktara As 10 ...	,, ,,
	Garkasannavari ...	,, ,,		ASC, 363/49 ...	,, ,,
	Kristnakatakulu ...	,, ,,		ASC. 501/122 b ...	,, ,,
	Akkulu ...	,, ,,		ASC. 503/93 ...	,, ,,
	Loomee ...	North West District		ASC. 536/48 ...	,, ,,
	B 15.1 ...	Burma		ASC. 536/140 ...	,, ,,
	C 14.8 ...	,,		ASC. 536/143 ...	,, ,,
	C 14.31 ...	,,		ASC. 536/198 ...	,, ,,
	C 15.10 —	,,		Seranp Kechil 48 ...	Fed. Malay State
	C 19.26 ...	,,		Radin 4 ...	,, ,,
	D 17.88 ...	,,		Radin 2 ...	,, ,,
	Belize River ...	British Honduras		Siam 29 ...	,, ,,
	Toledo District ...	,, ,,		Serendah 824 ...	,, ,,
	Selection 300 ...	California, U.S.A.		Nachin 27 ...	,, ,,
	Viola ...	,, ,,		Serendah 741 ...	,, ,,
	Caloro ...	,, ,,		Nachin 66 ...	,, ,,
	Pure 1600 ...	,, ,,		Radin Siak ...	,, ,,
	Vellai Pennol ...	Ceylon		Acheh 40 ...	,, ,,
	Hawaii Japanese ...	Hawaii		No. 1315 ...	Bombay, India
	Hawaii Chinese ...	,,		K. 42 ...	,, ,,
	D. 17.88 Karnakyi ...	Burma		K. 79 ...	,, ,,
	Mexican Edith ...	Canada		K. 226 ...	,, ,,
	Blue Rose Director ...	Canada		P. 6 ...	,, ,,
	Blue Rose Tall ...	,,		Sena India (32001) ...	Tanganyika
	Carolina Edith ...	,,		Sena ya Bukwimba (32003) ...	,,
	Peru ...	Peru		Bungala (32009) ...	,,
	Tead Rice ...	Vreed-en-Hoop		Sena Mtebe (32012) ...	,,
	Hope ...	Hope, E.C.D.		Afaa (32015) ...	,,
	Americano 1600 ...	Italy		Majimaji (32017) ...	,,
	Venezuela ...	North West District		Dacca No. 15 ...	Bengal, India
	Rupununi ...	Rupununi		Chinsurah No. 2 ...	,, ,,
	Berbice Creole ...	Berbice River		Bankura No. 1 ..	,, ,,
	Black Pin ...	,, ,,		Barisal No. 1 ...	,, ,,
	White Pin ...	,, ,,		Dacca No. 2 ...	,, ,,
	Berbice Barley ...	,, ,,		Dacca No. 4 ...	,, ,,
	Sago ...	,, ,,		Dacca No. 6 ...	,, ,,
	Lichfield ...	Lichfield, Berbice		E.B. No. 17 ...	Central Prov., India
	Macaw ...	Berbice		Surmatia No. 11 ...	,, ,,
	Elwi ...	Ceylon		Aranpapai No. 21 ...	,, ,,
	Guinangang Str. 1 ...	Phillippine Islands	D. 173	Gurmatia No. 6 ...	,, ,,
	Minalabon ...	,, ,,	D. 174	Kubrimohar ...	,, ,,
	Khao Bai Sri ...	,, ,,	D. 175	Luchai No. 15 ...	,, ,,
	Rexoro ...	Louisiana, U.S.A.	D. 176	Chinoor No. 21 ...	,, ,,
	Sonacalif ...	Fiji		Type 1 ...	United Prov., India
	Bendjalin ...	Surinam		Type 12 ...	,, ,,
D. 90	...	La Jalousie, W.C.D.		Type 21 ...	,, ,,
D. 91	...	,, ,,	D. 180	Type 23 ...	,, ,,
D. 93	...	,, ,,	D. 181	Type 100 ...	,, ,,
D. 95	...	,, ,,	D. 182	Type 110 ...	,, ,,
. 96	Louisiana ...	Louisiana, U.S.A.	D. 183	G.E.B. 24 ...	,, ,,

TABLE I. RICE VARIETIES DISCARDED UP TO DECEMBER, 1938.—(CONTD.)

Serial No.	Name.	Origin.
D. 184	Co. 7	Madras, India
	Adt. 2	" "
	Pichodi	" "
	Adt, 11	" "
D. 188	Maruter No. 8	" "
	Africa	Tanganyika
D. 190	Kilimani	"
D. 191	Jageranti	"
D. 192	Themanini	"
	Unyengiva	"
D. 195	Mivanga	"
D. 196	Borakupata	"
	Nabatat Abiad No. 2	Giza, Egypt
	Nabatat Asmar	" "
	Dibi	" "
	Yabani No. 2	" "
	Yabani No. 15	" "
	Sudani	" "
	Tamanini	" "
	Apostal	North Borneo
D. 205	M. Kabonegra	" "
	Kao Pin Kaeo	Bangkok, Siam
	Kao Bang Pra	" "
	Orealla No. 1	Orealla, Courantyne
	Orealla No. 2	" "
	Orealla No. 3	" "
	Orealla No. 4	" "
	Oerang-oerangan	Buitenzorg, Java
	Major	" "
	Poloe aloesoe	" "
	Maoemi	" "
	Glewang	" "
D. 217	...	No. 7, W.C., Berbice
D. 218	...	" "
D. 219	...	No. 63, Courantyne
D. 220	...	" "
D. 223	...	No. 74, "
D. 224	...	" "
D. 225	...	" "
D. 226	...	" "
D. 227	...	" "
D. 229	...	La Jalousie, W.C.D.
D. 230	Bengalo	Sind, India
	16—1—28	" "
	28—889—56	" "
	34—267—51	" "
	38—845—16	" "
D. 235	38—845—70	" "
D. 236	Inachupal	North Borneo
D. 237	Minalabon	" "
D. 238	Sipor	" "
D. 239	...	Bush Lot, Essequibo
D. 240	...	" "
D. 241	...	W.C., Berbice
D. 242	...	" "
D. 243	...	" "
D. 244	...	Bush Lot, Essequibo
D. 245	...	Berbice
D. 248	Tjina	Surinam
D. 249	Lombok	"
D. 252	...	Leguan
D. 261	...	W.C., Berbice
D. 262	...	" "
D. 263	...	Mahaicony
D. 264	...	"
D. 265	Indo-China	Sierra Leone
D. 266	Baitel Fakir	"
D. 267	Kavunginpoothala	Sierra Leone
D. 268	Panianala	"
D. 269	Durado Pelludo No. 1	Campinas, Brazil
D. 270	Dourado Liso No. 2	" "
D. 271	Agulha Dourado No. 3	" "
D. 272	Agulha No. 4	" "
D. 273	Catetinho No. 5	" "
D. 274	Catetinho Branco No. 6	" "
D. 275	Honduras No. 7	" "
D. 276	Jaguary No. 8	" "
D. 277	Iguape No. 9	" "
D. 278	Bice Preto No. 10	" "
D. 279	Picuhy No. 11	" "
D. 280	Parahyba No. 12	" "
D. 281	Mattao Liso No. 13	" "
D. 282	Blue Rose No. 14	" "
D. 283	Espinho No. 15	" "
D. 284	Dourado Agulha No. 21	" "
D. 285	Catete No. 22	" "
D. 286	Catete Dourado No. 23	" "
D. 287	Catetao No. 24	" "
D. 288	Douradao No. 25	" "
D. 289	Dourado No. 26	" "
D. 290	Omati No. 57	" "
D. 291	Carolina No. 28	" "
D. 292	Mattao Branco No. 29	" "
D. 293	Paraguayo No. 30	" "
D. 294	Carioquinha No. 31	" "
D. 295	...	Berbice
D. 296	...	"
	Padi Berbice	"
	Seymour S.	Essequibo
D. 3/37	...	Hybrid—D.C. x Americano 1600
D. 4/37	...	" "
D. 5/37	...	" "
D. 9/37	...	" "
D. 12/37	...	Hybrid—Kristnakatakulu x No. 79
D. 24/37	...	" "
D. 25/37	...	" "
D. 26/37	...	" "
D. 27/37	...	" "
D. 29/37	...	" "
D. 31/37	...	" "
D. 32/37	...	Georgetown Station
D. 33/37	...	" "
D. 35/37	...	" "
D. 36/37	...	" "
D. 44/37	...	" "
D. 45/37	...	" "
D. 46/37	...	" "
D. 47/37	...	" "
D. 48/37	...	" "
D. 59/37	...	Henrietta Station
D. 60/37	...	" "
D. 61/37	...	" "
D. 62/37	...	" "
D. 64/37	...	" "
D. 66/37	...	" "
	Bamboo Rice	W.C. Demerara
	S N 1	India
	S N 2	"
	S N 4	"
	S N 5	"
	S N 7	"

TABLE II. RICE VARIETIES UNDER OBSERVATION, DECEMBER, 1938.

Serial No.	Name.	Origin.
	Demerara Creole	Obscure
	Blue Stick	"
	McKenzie Large	"
	*McKenzie Small	"
	*H 7	"
	*No. 75	"
	*No. 76	"
	No. 79	"
	Ramca jara	Essequibo
	*Akkulu	Madras, India
	A 16.34	Burma
	*C 14.31	"
	*Toledo District	British Honduras
	*Lead Rice	Vreed-en-Hoop
	No. 36	Trinidad
	No. 11	Trinidad
	Kalyaman	"
	*Kupununi	Rupununi
	*White Pin	Berbice River
	*Minalabon	Philippine Islands
D. 88	...	La Jalousie, W.C.D.
D. 89	...	" "
*D. 90	...	" "
*D. 91	...	" "
D. 92	...	" "
D. 94	...	" "
*D. 95	...	" "
D. 97 A	...	Georgetown Station
D. 97 B	...	" "
D. 99	...	" "

* Discarded after Autumn Crop, 1938.

TABLE II. RICE VARIETIES UNDER OBSERVATION, DECEMBER, 1938—(CONTD.)

Serial No.	Name.	Origin.
*D. 100	...	Georgetown Station
	Karimganj	... Mandalay
	*Bommadeva	... ,,
*D. 108	...	La Jalousie, W.C.D.
D. 109	...	,, ,,
D. 110	...	,, ,,
D. 114	...	,, ,,
*D. 115	...	,, ,,
D. 116	...	,, ,,
	Unity	... Unity, E.C.D.
*D. 135	ASC. 501/122b	... Assam, India
*D. 150	Acheh 40	... Fed. Malay States
*D. 156	Sena India (32001)	... Bombay, India
*D. 160	Afaa (32015)	... Tanganyika
D. 162	Dacca No. 1	... Bengal, India
*D. 176	Chinoor No. 21	... Central Prov., India
*D. 183	G.E.B. 24	... Madras, India
*D. 184	Co. 7	... ,, ,,
*D. 188	Maruter No. 8	... ,, ,,
D. 193	Mpemba	... Tanganyika
*D. 205	M. Kabonegra	... North Borneo
	*Kao Bang Pra	... Siam
D. 221	...	No, 74, Courantyne
D. 222	...	,, ,,
*D. 224	...	,, ,,
*D. 225	...	,, ,,
*D. 228	...	E.B., Berbice
*D. 236	Inachupal	... North Borneo
*D. 238	Sipor	... ,,
*D. 239	...	Bush Lot, Essequibo
*D. 242	...	W.C., Berbice
*D. 243	...	,, ,,
*D. 244	...	Bush Lot, Essequibo
*D. 245	...	Berbice
D. 246	...	Georgetown Station
D. 247	...	,, ,,
*D. 248	Tjina	... Surinam
*D. 249	Lombok	... ,,
D. 250	...	Wakenaam
D. 251	...	,,
D. 253	...	Leguan
D. 254	...	,,
D. 255	...	Vreed-en-Hoop
D. 256	...	,,
D. 257	...	,,
D. 258	...	,,
D. 259	...	,,
D. 260	...	W.C., Berbice
*D. 261	...	,, ,,
*D. 262	...	,, ,,
*D. 263	...	Mahaicony
*D. 264	...	,,
*D. 266	Baitel Fakir	... Sierra Leone
*D. 267	Kavunginpoothala	... ,,
*D. 268	Parianala	... ,,
D. 597	...	Georgetown Station
	*Padi Berbice	.. Berbice
	Nickerie Patna	... ,,
	*Seymour S	... Essequibo
	Rexoro	... Surinam
	Pendjalin	... ,,
	Vari Lava	... ,,
D. 1/37	...	Hybrid—D.C. x Americano 1600
*D. 3/37	...	,, ,,
*D. 4/37	...	,, ,,
*D. 5/37	...	,, ,,
D. 7/37	...	,, ,,
D. 8/37	...	,, ,,
*D. 9/37	...	,, ,,
D. 11/37	...	Hybrid—Mexican Edith x D.C.
*D. 12/37	...	Hybrid—Kristna-katakulu x No. 79
D. 13/37	...	,, ,,
D. 14/37	...	,, ,,
D. 15/37	...	,, ,,
D. 16/37	...	,, ,,
D. 17/37	...	,, ,,
D. 18/37	...	,, ,,
D. 19/37	...	,, ,,
D. 20/37	...	,, ,,
D. 21/37	...	,, ,,
D. 22/37	...	,, ,,
D. 23/37	...	,, ,,
*D. 24/37	...	,, ,,
*D. 25/37	...	,, ,,
*D. 26/37	...	,, ,,
*D. 27/37	...	,, ,,
D. 28/37	...	,, ,,
*D. 29/37	...	,, ,,
D. 30/37	...	,, ,,
*D. 31/37	...	Hybrid—Kristna-katakulu x No. 79
*D. 32/37	...	Georgetown Station
*D. 33/37	...	,, ,,
D. 34/37	...	,, ,,
*D. 35/37	...	,, ,,
*D. 36/37	...	,, ,,
D. 37/37	...	,, ,,
D. 38/37	...	,, ,,
D. 39/37	...	,, ,,
D. 40/37	...	,, ,,
D. 41/37	...	,, ,,
D. 42/37	...	,, ,,
D. 43/37	...	,, ,,
*D. 44/37	...	,, ,,
*D. 45/37	...	,, ,,
*D. 46/37	...	,, ,,
*D. 47/37	...	,, ,,
*D. 48/37	...	,, ,,
D. 49/37	...	Henrietta Station
D. 50/37	...	,, ,,
D. 51/37	...	,, ,,
D. 52/37	...	,, ,,
D. 53/37	...	,, ,,
D. 54/37	...	,, ,,
D. 55/37	...	,, ,,
D. 56/37	...	,, ,,
D. 57/37	...	,, ,,
D. 58/37	...	,, ,,
*D. 59/37	...	,, ,,
*D. 60/37	...	,, ,,
*D. 61/37	...	,, ,,
*D. 62/37	...	,, ,,
D. 63/37	...	,, ,,
*D. 64/37	...	,, ,,
D. 65/37	...	,, ,,
*D. 66/37	...	,, ,,
D. 67/37	...	,, ,,
D. 68/37	...	,, ,,
D. 69/37	...	,, ,,
D. 70/37	...	Berbice
D. 71/37	...	,,
	*Bamboo Rice	... W.C., Demerara
	*SN 1	... India
	*SN 2	... ,,
	SN 3	... ,,
	*SN 4	... ,,
	*SN 5	... ,,
	SN 6	... ,,
	*SN 7	... ,,
	SN 8	... ,,
D, 1/38	...	Henrietta Station
D. 2/38	...	,, ,,
D, 3/38	...	,, ,,
D. 4/38	...	,, ,,
D. 5/38	—	,, ,,
D. 6/38	...	,, ,,
D. 7/38	...	,, ,,
D, 8/38	...	,, ,,
D. 9/38	...	,, ,,
D. 10/38	...	,, ,,
D. 11/38	...	,, ,,
D. 12/38	...	,, ,,
D. 13/38	...	,, ,,
D. 14/38	...	,, ,,
D. 15/38	...	,, ,,
D. 16/38	...	,, ,,
D. 17/38	...	,, ,,
D. 18/38	...	,, ,,
D. 19/38	...	,, ,,
D. 20/38	...	,, ,,
D. 21/38	...	,, ,,
D. 22/38	...	,, ,,
D. 23/38	...	,, ,,
D. 24/38	...	,, ,,
D. 25/38	...	,, ,,
D. 26/38	...	,, ,,
D. 27/38	...	,, ,,
D. 28/38	...	,, ,,
D. 29/38	...	,, ,,
D. 30/38	...	,, ,,
D. 31/38	...	Georgetown Station
D. 32/38	...	,, ,,
D. 33/38	...	,, ,,
D. 34/38	...	,, ,,
D. 35/38	...	,, ,,
D. 36/38	...	,, ,,
D. 37/38	...	,, ,,
D. 38/38	...	,,
D. 39/38	...	,, ,,
D. 40/38	...	,, ,,
D. 41/38	...	,, ,,

* Discarded after Autumn Crop, 1938.

TABLE II. RICE VARIETIES UNDER OBSERVATION, DECEMBER, 1938.—(CONTD.)

Serial No.	Name.	Origin.	Serial No.	Name.	Origin.
D. 42/38	...	Georgetown Station		Benab 79 ...	No. 70, Courantyne
D. 43/38	...	,, ,,		Babylon 1 ...	,, ,,
D. 44/38	...	,, ,,		Benab 1 ...	,, ,,
D. 45/38	...	,, ,,		Aganya ...	,, ,,
D. 46/38	...	,, ,,	D. 73/38	...	Henrietta Station
D. 47/38	...	,, ,,	D. 74/38	...	,, ,,
D. 48/38	...	,, ,,	D. 75/38	...	,, ,,
D. 49/38	...	,, ,,	D. 76/38	...	,, ,,
D. 50/38	...	,, ,,	D. 77/38	...	,, ,,
D. 51/38	...	,, ,,	D. 78/38	...	,, ,,
D. 52/38	...	,, ,,	D. 79/38	...	,, ,,
D. 53/38	...	,, ,,	D. 80/38	...	,, ,,
D. 54/38	...	,, ,,	D. 81/38	...	,, ,,
D. 55/38	...	,, ,,	D, 82/38	...	,, ,,
D. 56/38	...	,, ,,	D. 83/38	...	,, ,,
D. 57/38	...	,, ,,	D. 84/38	...	,, ,,
D. 58/38	...	,, ,,	D. 85/38	...	,, ,,
D. 59/38	...	,, ,,		Laghu 116 A—15—7—5 ...	Orissa, India
D. 60/38	...	,, ,,		Laghu 635—14—1 ...	,, ,,
D. 61/38	...	,, ,,		Dahia 425—2—3—31 ...	,, ,,
D. 62/38	...	,, ,,		Cuttack No. 1—897—20—18.	,, ,,
D. 63/38	...	,, ,,		Cuttack No. 1—847—1—8 ...	,, ,,
D. 64/38	...	,, ,,		Honduras (var. 51) ...	Brazil
D. 65/38	...	,, ,,		Boa Vista (var. 52) ...	,,
D. 66/38	...	,, ,,		Mattao (var. 53) ...	,,
D. 67/38	...	,, ,,		Agulha (vor. 55) ...	,,
D. 68/38	...	,, ,,		Jaguary Longo (var. 79) ...	,,
D. 69/38	...	,, ,,		Success Padi ...	Wakenaam
D. 70/38	...	,, ,,		Hope Padi ...	Hope, E.C.D.
B. 71/38	...	,, ,,		Dahia 442—1—36—25 ...	Orissa, India
D. 72/38	...	,, ,,			

9. The varieties under observation during 1938 totalled, for the Spring Crop, 178, and for the Autumn Crop, 236. Of the latter, 169 were tested by the quasi-factorial design, a layout which has the advantage, over simple progeny-row comparisons, of providing statistical criteria on which varieties can be selected for inclusion in more detailed tests, or definitely discarded. This new method promises to be very useful for the examination of large numbers of rice varieties, but the progeny rows will be retained for acclimatising exotic varieties and purifying local selections.

HYBRIDISATION.

10. Towards the end of 1938, F_3, F_2 and F_1 generations of various crosses were planted out. The F_3's were selections from crosses made in the Autumn of 1937, the F_2's from crosses made in the Spring of 1938, and the F_1's from crosses made in the Autumn of 1938. Table III gives a list of these crosses.

TABLE III.

PARENTS OF F 3, F 2 AND F 1 POPULATIONS PLANTED OUT, DECEMBER, 1938.

F_3.			F_2.			F_1.		
Parents.			No. of Selections.	Parents.			Parents.	
D. 91	x	S ..	10	A 16.34	x	D.C.	No. 36	x D.C.
D. 92	x	S ...	10	D. 114	x	D.C.	Afaa (32015)	x D.C.
D. 221	x	S ...	15	D.C.	x	Karimganj	D.C.	x M Kabonegra
D. 88	x	S ...	10	D.C.	x	Dacca No. 1	B.S.	x D. 99
S	x	D.C. ...	11	D.C	x	Sena India (32001)	D. 99	x B.S.
No. 79	x	D.C. ...	10	Mpemba	x	D. 114	Dacca No. 1	x D. 114
Kalyaman	x	D.C. ...	10	D. 114	x	D- 91		
D. 228	x	D.C. ...	12	D. 114	x	B.S.		
*C	x	D.C. ...	10	D. 114	x	No. 79		
†B	x	D.C. ...	10	D. 114	x	K rimganj		
D. 91	x	D.C. ...	10	D. 114	x	Sena India (32001)		
D. 88	x	D.C. ...	10	D. 99	x	D. 114		
D. 92	x	D.C. ..	12	D. 99	x	D. 116		
B.S.	x	D.C. ...	10	D. 99	x	S		
Minalabon	x	B.S. ...	10	S	x	D. 89		
D. 228	x	B.S. ...	10	S	x	Mc Kenzie Small		
D. 221	x	B.S. ...	10	D. 91	x	No. 75		
Kalyaman	x	B.S. ...	10	D. 91	x	D. 228		
D. 221	x	No. 79 ...	10	D. 91	x	Kalyaman		
‡V	x	No. 79 ...	10	D. 115	x	Sena India (3200)1		
‡V	x	Kristnakatakulu	2	D. 115	x	Dacca No. 1		
D. 228	x	D.C. ...	10					
Minalabon	x	D.C. ...	10					

† B = Hybrid of D.C. x Americano 1600.
* C = Hybrid of Mexican Elith x D.C.
‡ V = Hybrid of Kristnakatakulu x No. 79.

EXPERIMENTS REAPED.

11. Twenty-two Variety trials were originally laid down at various sites in the Colony, but five at Whim, Courantyne, failed, due to a lack of water supply at flowering time, so that only seventeen trials were reaped. The results of these trials were reported in *The Agricultural Journal of British Guiana*, X, No. 1, pp. 13–20.

MISCELLANEOUS.

12. *Guavas.*—With a view to gathering some information on guava yields, genetics, etc., a small collection of various types, collected locally, was planted out during the year.

13. *Cigarette Tobacco.*—The possibility of the expanding local cigarette industry offering a market for colony-grown tobacco, led to an investigation of the problems of growing and flue-curing a light tobacco type with a view to providing a subsidiary occupation for sugar estate labourers whose employment might be adversely affected by the quota limitation of the sugar output.

14. A small barn, capable of an output of 100 lb. of cured leaf was erected in the Sugar Experiment Station compound, and two crops of the "Gold Dollar" strain were harvested from Field 17 West, where the soil is somewhat lighter than the usual frontland type.

15. The crops were adversely affected by the very abnormal distribution of the rainfall. From January to April the excess over the normal totalled 27.93 in.; there was again an excess of 7·38 in. in August and a deficit of 6·46 in. in December. Excessive rains also hampered the harvesting and curing operations

16. Despite these set-backs, the yield of the Spring crop was 564 lb. of cured leaf per acre which, on sale to local cigarette factories, yielded a profit, on cultivation and curing costs excluding capital cost of barn, of $25.29 per acre.

17. The Autumn crop was severely damaged by the rains and less that one-third of the area originally prepared and planted came to maturity. From the half acre reaped, 175 lb. of cured tobacco was sold for $93.19.

18. The reports on the cured product have been very encouraging and further work with tobacco will be conducted during 1939. In the meantime, considerable interest has been aroused among farmers and there is a demand for seed, information, barn-plans, etc.

Rainfall.

19. Table IV compares the 1938 monthly rainfall at the Rice Experiment Station with the monthly average from 1903-38.

Table IV.

Actual Rainfall 1938.	Average Rainfall 1903-38.	Excess or Deficit.
In.	In.	In.
11.95	8.18	3.77
15.05	4.66	10.39
13.80	5.67	8.13
8.58	5.82	2.76
10.69	11.63	–0.94
12.59	11.88	0.71
12.38	9.68	2.70
14.88	6.91	7.97
2.11	2.73	–0.62
3.59	3.08	0.51
4.89	5.37	–0.48
6.99	11.48	–4.53
117.46	87.09	30.37

20. The total precipitation was abnormally high. The excesses were recorded mainly from January to April and again in August, and for the first eight months of the year the monthly total was never under ten inches except in April when it was over eight and a half. On the other hand, the rainfall tended to be low during the last four months of the year and was markedly deficient in December.

ACKNOWLEDGMENTS.

21. The writers wish to record their appreciation of the services rendered by the Staff of the Rice Experiment Station.

C. HOLMAN B. WILLIAMS,
Sugar Agronomist and Plant Breeder.

P. A. CHAN-CHOONG,
Assistant Plant Breeder.

March 31, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE SUGAR EXPERIMENT STATIONS FOR THE YEAR 1938.

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REPORT ON THE SUGAR EXPERIMENT STATIONS FOR THE YEAR 1938.

Staff.

C. H. B. Williams, M.A., A.I.C.T.A., Dip. Agr.	...Sugar Agronomist and Plant Breeder.
C. Cameron	...Field Manager.
L. A. Forte	...Field Assistant.
B. A. MacArthur	...Field Assistant
H. B. Singh	...Laboratory Assistant.
A. V. Wan Ping, Dip. Agr.	...Laboratory Assistant.
J. B. Bourne	...Statistical Assistant.

2. Mr. Williams was appointed Sugar Agronomist and Plant Breeder on January 1, 1938. The post of Plant Breeder had been vacant since July 7, 1936, when Mr. Codd proceeded on leave prior to his resignation.*

3. Mr. Singh is to be congratulated on having passed the final examination in Sugar Technology of the City and Guilds Institute, London.

4. Various members of the Staff were absent from duty as follows :—
Mr. Williams, June 18 to December 31 (Vacation Leave).
Mr. Forte, January 10 to February 9 (Vacation Leave).
Mr. Singh, January 1 to 6 (Vacation Leave).
Mr. Mac Arthur, June 20 to September 20 (Vacation Leave).
Mr. Bourne, July 4 to October 3 (Vacation Leave).

Committee.

5. The following members formed the Sugar Experiment Stations' Committee for the year :—

The Director of Agriculture	...Chairman.
Mr. J. C. Gibson	...Pln. Port Mourant.
Hon. M. B. G. Austin	...Messrs. Curtis Campbell & Co., Ltd.
Mr. A. Murison	...Pln. Uitvlugt.
Mr. J. Bee	...Pln. Albion.
Mr. R. E. Rhodes	...Pln. Diamond.
Mr. G. M. Eccles	...Pln. Blairmont
Mr. C. L. C. Bourne	...Secretary to the Committee.

6. During the absences from the Colony of the substantive Members of the Committee, Mr. H. F. Chapman, acted for Mr. G. M. Eccles and Mr. Jas. Sutherland acted for Mr. James Bee.

Finance.

7. The sum of $23,140 was voted from the funds of the Sugar Experiment Stations' Committee for the working of the Station during the year. A total of $22,792.38 was spent. Receipts from Assessments for the year amounted to $16,739.75 ; those from Sale of Canes to $3,219.35 and Miscellaneous Receipts to $646.35.

Equipment.

8. Buildings, etc., were maintained in a proper state of repair. The major improvements included the provision of :—

(*a*) A new polariscope to replace a very old one which had got beyond repair;
(*b*) A trolley and rails to facilitate the transport of cuttings, samples, manures, etc., across the Lamaha canal ;
(*c*) A wiring system, dynamo, batteries and "wind-charger" to provide electric light for the mill-room and juice laboratory ;
(*d*) A new wooden punt for transporting cuttings, samples, etc. ;
(*e*) An iron gate to replace the delapidated wooden one at the main entrance.

* The appointment of Mr. Chan-Choong as Assistant Plant Breeder, will enable his services to be utilized also with sugar and permit close collaboration between the Sugar and Rice Stations.

Cane Breeding and Introduction.

9. Table I lists, under their year of production, the number of Demerara seedlings in field experiments and those undergoing further multiplication and selection.

TABLE I.

DEMERARA SEEDLINGS IN TESTS AND UNDERGOING MULTIPLICATION, ETC., DECEMBER, 1938.

Year.	Number of Seedlings.	
	In Tests.	Under Multiplication, Etc.
1929 ...	1	..
1930 ...	7	...
1931 ...	1	...
1932 ...	2	2
1933 ...	25	1
1934 ...	18	33
1935 ...	...	129
1936 ...	...	64
1937 ...	...	310
Total ...	54	539

10. *The 1936 seedlings* have been subjected to their second selection. Of the combinations tried (see pp. 64–66 of *Divisional Reports*, Department of Agriculture, British Guiana, 1937), the following yielded the highest percentages of second selections on

(*a*) Clay	and	(*b*) Pegasse
P.O.J. 2878 x Co. 213		D. 182/30 x Diamond 10
D. 121/33 x D. 40/33		D. 456/33 x D. 66/30
D. 127/33 x Diamond 10		D. 38/30 x Diamond 10
D. 46/33 x Diamond 10		D. 127/33 x D. 66/30
D. 126/33 x Diamond 10		D. 49/30 x Diamond 10
D. 27/33 x Diamond 10		B. 6835 x Diamond 10
D. 27/33 x D. 66/30		D. 126/33 x Diamond 10
		D. 666/18 x D. 66/30

11. *The 1937 Seedlings* have undergone their first selection and Table II lists the combinations attempted, the number of seedlings basketed from each cross, transplanted to the field and chosen at the first selection.

TABLE II. CROSSES ATTEMPTED, SEEDLINGS SELECTED, ETC., 1937.

Combinations.	No. of Arrows used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.			First Selection.			
				On Pegasse.	On Clay.	Total.	Pegasse.		Clay.	
							No.	%.	No.	%.
I. "NOBLE" CROSSES.										
D. 625 x Diamond 10 ...	1	3	500	...	434	434	...	...	...	...
D. 118/02 x ,, ...	1	1	200	...	154	154	...	...	1	0.65
D. 666/18 x ,, ...	3	8	194	...	140	140	...	...	...	...
D. 602/22 x ,, ...	2	3	11	...	11	11	...	...	...	...
D. 1/28 x ,, ...	8	8	1,870	628	680	1,308	...	...	16	2.35
D. 11/28 x ,, ...	4	6	530	98	364	462	...	...	8	2.20
D. 154/28 x ,, ...	5	7	1.200	...	1,052	1,052	...	...	41	3.90
D. 10/30 x ,, ...	2	2	240	199	28	227	...	...	...	...
D. 49/30 x ,, ...	6	11	30	10	17	27	...	...	...	...
D. 66/30 x ,, ...	8	10	3,140	1,005	1 231	2,236	7	0.70	22	1.79
D. 75/30 x ,, ...	3	4	300	...	280	280	...	...	5	1.79
D. 78/30 x ,, ...	3	4	5	...	2	2	..	...	..	...
D. 88/30 x ,, ...	4	7	32)	...	306	306	...	..	15	4.90
D. 113/30 x ,, ...	4	7	1.320	200	805	1,005	...	...	13	1.61
D. 164/30 x ,, ...	4	8	231	94	84	178	...	...	2	2,38
D. 165/30 x ,, ...	4	3	22	...	14	14	...	...	1	7.14
D. 170/30 x ,, ...	4	6	1,046	475	458	933	2	0.42	9	1·96
D. 173/30 x ,, ...	1	1	13	12	...	12	...	...	...	...
D. 182/30 x ,, ...	3	3	228	80	98	178	...	...	...	...
D. 205/30 x ,, ...	4	5	580	262	249	511	2	0.76	14	5.62
D. 2/31 x ,, ...	12	11	463	...	420	420	...	...	17	4.05
D. 46/33 x ,, ...	2	5	383	...	336	336	...	...	6	1.79
D. 53/33 x ,, ...	3	3	170	81	82	163	1	1.23	1	1.22
D. 129/33 x ,, ..	3	3	40	...	30	30	...	...	1	3.33
D. 143/33 x ,, ...	1	1	8	...	3	3	...	...	...	...

TABLE II—(CONTD.). CROSSES ATTEMPTED, SEEDLINGS SELECTED, ETC., 1937.

Combinations.	No. of Arrows Used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.			First Selection.			
				On Pegasse.	On Clay.	Total.	Pegasse.		Clay.	
							No.	%	No.	%
I.—(CONTD.) "NOBLE" CROSSES.										
D. 189/33 x ,,	2	2	...	...	...	...	...	...	...	...
D. 493/33 x ,,	2	2	...	...	...	...	...	...	...	...
D. 552/33 x ,,	2	2	...	...	...	...	...	...	...	...
D. 687/33 x ,,	2	2	96	79	6	85	...	...	...	...
D. 694/33 x ,,	2	2	47	...	42	42	...	...	...	...
D. 110/34 x ,,	3	3	172	...	138	138	...	...	...	...
D. 113/34 x ,,	2	1	55	...	36	36	...	...	...	...
D. 156/34 x ,,	2	5	112	...	84	84	...	...	1	1.19
D. 157/34 x ,,	2	2	3	...	3	3	...	...	...	...
D. 169/34 x ,,	1	1	35	...	28	28	...	...	...	...
D. 36/35 x ,,	2	2	99	...	80	80	...	...	...	...
B. 2931 x ,,	2	1	4	...	3	3	...	...	...	...
B. 3439 x ,,	2	1	2	...	2	2	...	...	...	...
B. 6835 x ,,	4	2	...	...	...	...	...	...	...	...
E.K. 28 x ,,	3	6	...	...	...	...	...	...	...	...
J. 73 x ,,	3	2	270	...	168	168	...	...	8	4.76
Pitu x ,,	2	4	...	...	...	...	...	...	...	...
S.C. 12/4 x ,,	8	15	874	131	652	783	1	0.76	27	4.14
T. 1198 x ,,	2	1	4	...	...	...	...	...	...	...
Tamarind x ,,	4	6	176	79	57	136	...	...	...	...
D. 666/18 x D. 66/30	2	3	131	38	56	94	...	...	...	...
D. 424/21 x ,,	4	2	...	...	...	...	...	...	...	...
D. 1/28 x ,,	4	12	1,472	717	676	1,393	3	0.42	14	2.07
D. 49/30 x ,,	8	8	339	249	61	310	...	...	...	...
D. 78/30 x ,,	3	1	...	...	...	...	...	...	...	...
D. 2/31 x ,,	12	22	345	...	334	334	...	...	3	0.90
D. 27/33 x ,,	2	5	9	...	3	3	...	...	...	...
D. 53/33 x ,,	2	4	43	...	28	28	...	...	...	...
D. 129/33 x ,,	3	3	2	...	2	2	...	...	...	...
D. 143/33 x ,,	2	1	30	...	24	24	...	...	...	...
D. 113/34 x ,,	2	1	145	...	84	84	...	...	5	5.95
E.K. 28 x ,,	3	4	...	...	...	...	...	...	...	...
Red Ribbon x ,,	3	2	...	...	...	...	...	...	...	...
S.C. 12/4 x ,,	4	9	411	74	304	378	...	...	...	...
D. 666/18 x S.C. 12/4	4	5	53	...	42	42	...	...	1	2.38
D. 49/30 x ,,	3	3	120	...	96	96	...	...	1	1.04
D. 75/30 x ,,	4	4	98	...	92	92	...	...	...	...
D. 164/30 x ,,	4	4	11	...	5	5	...	...	...	...
D. 165/30 x ,,	4	2	15	...	14	14	...	...	...	...
D. 173/30 x ,,	1	1	100	93	5	98	...	...	...	...
D. 666/18 x D. 625	3	2	16	...	13	13	...	...	...	...
S.C. 12/4 x ,,	3	6	109	...	87	87	...	...	...	...
D. 11/28 x D. 110/34	2	2	10	...	...	...	...	...	...	...
D. 110/34 x D. 666/18	4	5	414	...	308	308	...	...	10	3.25
Total ...	233	298	18,866	4,604	10,811	15,415	16	0.35	242	2.24
II.—INTERSPECIFIC CROSSES.										
1. 2nd Nobilised Glagah:—										
Kassoer x Diamond 10	2	2	...	...	...	...	...	...	...	...
2. 3rd Nobilised Glagah:—										
P.O.J. 2364 x Diamond 10	4	4	3	...	3	3	...	...	...	...
T.J.E.P. 24 x ,,	4	4	12	...	11	11	...	...	...	...
Total ...	8	8	15	...	14	14	...	...	...	...
3. 4th Nobilised Glagah:—										
P.O.J. 2714 x Diamond 10	1	3	...	...	...	...	...	...	...	...
P.O.J. 2725 x ,,	6	6	9	...	6	6	...	...	...	...
P.O.J. 2725 x D. 66/30	4	4	10	...	...	...	...	...	...	...
P.O.J. 2725 x S.C. 12/4	3	3	13	...	10	10	...	...	...	...
P.O.J. 2727 x Diamond 10	6	4	...	...	...	...	...	...	...	...
P.O.J. 2878 x ,,	8	11	26	...	15	15	...	...	...	...
P.O.J. 2878 x D. 625	2	2	3	...	...	...	...	...	...	...
P.O.J. 2878 x D. 666/18	6	6	...	...	...	...	...	...	...	...
P.O.J. 2878 x D. 11/28	4	5	...	...	...	...	...	...	...	...
P.O.J. 2878 x D. 49/30	8	11	6	...	3	3	...	...	...	...
P.O.J. 2878 x D. 66/30	10	12	12	...	10	10	...	...	...	...
P.O.J. 2878 x D. 75/30	5	6	15	...	11	11	...	...	...	...
P.O.J. 2878 x D. 170/30	7	7	20	...	17	17	...	...	...	...
P.O.J. 2878 x D. 205/30	4	4	...	...	...	...	...	...	...	...
P.O.J. 2878 x D. 2/31	8	8	5	...	5	5	...	...	...	...
P.O.J. 2878 x D.46/33	7	8	17	...	15	15	...	...	...	...
P.O.J. 2878 x D.55/33	4	6	...	...	...	...	...	...	...	...
P.O.J. 2878 x D.57/33	2	5	12	...	6	6	...	...	...	...
P.O.J. 2878 x D.129/33	2	2	...	...	...	...	...	...	...	...
P.O.J. 2878 x D.687/33	4	4	2	...	2	2	...	...	...	...
P.O.J. 2878 x D.694/33	3	3	4	...	4	4	...	...	...	...
P.O.J. 2878 x D.110/34	3	3	2	...	2	2	...	...	...	...
P.O.J. 2878 x D.113/34	1	2	4	...	3	3	...	...	...	...
P.O.J. 2878 x B. 6835	3	3	3	...	2	2	...	...	...	...
D. 171/29 x Diamond 10	6	9	110	97	...	97	...	...	...	...
D. 171/29 x D. 66/30	6	6	240	181	...	181	2	1.10	...	...
D. 171/29 x D. 46/33	2	2	...	...	...	...	...	...	...	...
Total ...	125	145	513	278	111	389	2	0.72	...	...

TABLE II—(Contd.). CROSSES ATTEMPTED, SEEDLINGS SELECTED, Etc., 1937.

Combinations.	No. of Arrows Used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.			First Selection.			
				On Pegasse.	On Clay.	Total.	Pegasse.		Clay.	
							No.	%	No.	%
4. 5th Nobilished Glagah:—										
D. 456/33 x Diamond 10 ...	3	5	116	...	110	110	...	...	3	2.73
D. 23/35 x ,, ...	3	6	7	...	4	4	...	...	...	...
D. 24/35 x ,, ...	3	2	868	391	465	856	1	0.26	1	0.21
M.P.R. 7 x ,, ...	4	6	6	...	6	6	...	...	...	...
M.P.R. 145 x ,, ...	3	4	1	...	...	...	...	...	...	...
M.P.R. 151 x ,, ...	3	8	3	...	3	3	...	...	...	...
F.C. 916 x ,, ...	3	4	2	...	2	2	...	...	...	...
D. 450/33 x S.C.12/4 ...	3	2	3	...	2	2	...	...	...	...
M.P.R. 7 x ,, ...	4	5	...	...	...	...	...	...	...	...
F.C. 916 x ,, ...	2	1	...	...	...	...	...	...	...	...
D. 450/33 x D. 66/30 ...	3	2	104	53	41	94	...	...	5	12.20
D. 456/33 x ,, ...	2	4	29	21	3	24	...	...	...	...
M.P.R. 145 x ,, ...	3	5	...	...	...	...	...	...	...	...
D. 456/33 x D. 110/34 ...	4	4	42	...	40	40	...	...	...	...
D. 450/33 x D. 38/33 ..	2	4	63	20	32	52	...	...	5	15.62
Red Ribbon x D. 450/33 ..	1	2	...	...	...	...	...	...	...	...
M.P.R. 49 x D. 438/21 ...	1	2	6	...	6	6	...	...	...	...
M.P.R. 151 x D. 694/33 ...	2	2	2	...	2	2	...	...	...	...
Total	49	68	1,252	485	716	1,201	1	0.21	14	1.96
5. Glagah, Chunnee and Noble Combinations.										
Co. 213 x Diamond 10 ...	12	5	11	...	8	8	...	...	...	...
Co. 281 x ,, ...	8	6	7	...	2	2	...	...	...	...
P.O.J. 1499 x ,, ..	1	1	2	...	1	1	...	...	...	...
P.O.J. 2753 x ,, ...	4	2	...	...	...	...	...	...	...	...
D. 330/33 x ,, ...	2	1	...	...	...	...	...	...	...	...
D. 419/33 x ,, ...	2	2	...	...	...	...	...	...	...	...
D. 3/34 x ,, ...	1	1	...	...	...	...	...	...	...	...
D. 14/34 x ,, ...	1	2	...	...	...	...	...	...	...	...
D. 17/35 x ,, ...	3	4	...	...	...	...	...	...	...	...
D. 18/35 x ,, ...	3	5	21	...	14	14	...	...	...	...
D. 20/35 x ,, ...	3	4	...	...	..	..	...	...	...	...
D. 21/35 x ,, ...	3	6	...	...	...	...	...	...	...	...
D. 330/33 x D. 66/30 ...	2	1	...	...	...	...	...	...	...	...
D. 419/33 x ,, ...	2	2	...	...	...	...	...	...	...	...
D. 3/34 x ,, ..	2	3	4	...	3	3	...	...	...	...
D. 14/34 x D. 66/30 ...	2	2	...	...	...	...	...	...	...	...
D. 14/35 x ,, ...	1	2	...	...	...	...	...	...	...	...
D. 17/35 x ,, ...	3	6	...	...	...	...	...	...	...	...
D. 3/34 x D. 170/30 ...	2	4	...	...	...	...	...	...	...	...
D. 13/35 x ,, ...	1	1	...	...	...	...	...	...	...	...
D. 4/35 x D. 46/33 ...	1	1	...	...	...	...	...	...	...	...
D. 3/34 x D. 57/33 ...	1	2	1	...	1	1	...	...	...	...
D. 8/35 x ,, ...	1	2	4	...	4	4	...	...	...	...
D. 14/35 x ,, ...	1	2	1	...	1	1	...	...	...	...
D. 14/34 x D. 450/33 ...	2	1	...	...	...	...	...	...	...	...
P.O.J. 2725 x Co. 213 ...	8	12	20	...	15	15	...	...	...	...
P.O.J. 2878 x ,, ...	6	6	19	...	18	18	...	...	...	...
D. 5/34 x ,, ...	1	1	...	...	...	...	...	...	...	...
D. 171/29 x ,, ...	3	6	130	86	40	126	1	1.16	...	...
P.O.J. 2725 x Co. 281 ...	4	5	6	...	6	6	...	...	...	...
P.O.J. 2878 x ,, ...	4	4	6	...	6	6	...	...	...	...
D. 14/34 x S.C. 12/4 ...	1	1	...	...	...	...	...	...	...	...
Total ...	91	103	232	86	119	205	1	1.16	...	...
6. Other Combinations.										
Kavangire x Diamond 10 ...	2	1	...	...	...	...	...	...	...	...
P.O.J. 253 x D. 170/30 ...	1	2	107	...	96	96	...	...	...	...
P.O.J. 2878 x D. 450/33 ...	4	4	...	...	...	...	...	...	...	...
P.O.J. 2878 x D. 456/33 ...	4	4	1	...	1	1	...	...	...	...
P.O.J. 2878 x D. 481/33 ...	2	2	2	...	2	2	...	...	...	...
D. 360/35 x Diamond 10 ...	4	4	40	...	21	21	...	...	...	...
D. 360/35 x D. 450/33 ...	1	1	3	...	1	1	...	...	...	...
Gehra Bon x Brekeret ...	1	1	...	...	...	...	...	...	...	...
Total ...	19	19	153	...	121	121	...	...	...	...
III. INTERGENERIC CROSSES.										
1. Primary Crosses.										
Co. 213 x Sorghum ...	3	2	2	...	2	2	...	...	...	...
P.O.J. 2878 x ,, ...	4	5	7	...	6	6	...	...	...	...
Kavangire x Teosinte ...	1	2	...	...	...	...	...	...	...	...
P.O.J. 2725 x ,, ...	1	1	...	...	...	...	...	...	...	...
P.O.J. 2878 x ,, ...	2	6	3	...	2	2	...	...	...	...
P.O.J. 2725 x Bamboo ...	2	2	2	...	2	2	...	...	...	...
Total ...	13	18	14	...	12	12	...	...	...	...

TABLE II—(CONTD.). CROSSES ATTEMPTED, SEEDLINGS SELECTED, ETC., 1937.

Combinations.	No. of Arrows Used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.			First Selection.			
				On Pegasse.	On Clay.	Total.	Pegasse.		Clay.	
							No.	%	No.	%
III.—(CONTD.)—INTERGENERIC CROSSES.										
2. First Back-crosses.										
D. 711/33 x Diamond 10 ...	1	2	...	...	...	...	...	...	...	...
D. 717/33 x ,, ...	1	1	...	...	...	...	...	...	...	...
D. 5/34 x ,, ...	1	1	...	...	...	...	...	...	...	...
D. 166/34 x ,, ...	3	4	910	299	447	746	...	...	18	4.03
D. 482/36 x ,, ...	2	1	...	...	...	...	...	...	...	...
D. 483/36 x ,, ...	1	1	4	...	3	3	...	...	...	...
D. 484/36 x ,, ...	1	1	2	...	...	...	...	...	...	...
D. 485/36 x ,, ...	1	1	10	...	6	6	...	...	...	...
D. 482/36 x Co. 213 ...	1	1	...	...	...	...	...	...	...	...
D. 166/34 x D. 666/18 ...	4	5	281	...	212	212	...	...	3	1.41
D. 484/36 x D. 110/34 ...	1	1	9	...	6	6	...	...	...	...
D. 11/28 x D. 166/34 ...	2	2	14	...	12	12	...	...	2	16.67
D. 121/33 x ,, ...	1	1	170	...	126	126	...	...	...	...
D. 189/33 x ,, ...	1	1	...	...	...	...	...	...	...	...
D. 456/33 x ,, ...	3	3	110	...	108	108	...	...	...	...
D. 106/34 x ,, ...	2	2	36	...	33	33	...	...	1	3.03
D. 110/34 x ,, ...	4	4	106	...	71	71	...	...	5	7.04
D. 113/34 x ,, ...	1	2	116	...	84	84	...	...	...	...
D. 143/34 x D. 166/34 ...	2	1	34	...	27	27	...	...	...	...
D. 711/33 x D. 66/30 ...	1	3	...	...	...	...	...	...	...	...
D. 166/34 x ,, ...	2	1	56	25	28	53	...	...	1	3.57
Total	36	39	1,858	324	1,163	1,487	...	...	30	2.58
IV.—SELFINGS.										
Gehra Bon	1	1	8	...	8	8	...	...	...	...
P.O.J. 253	1	2	190	...	184	184	...	...	...	...
P.O.J. 2753	1	1	20	...	16	16	...	...	...	...
D. 166/34	1	1	300	100	126	226	...	...	4	3.17
Total	4	5	518	100	334	434	...	...	4	1.20
Grand Total ...	580	705	23,421	5,877	13,401	19,278	20	0.34	290	2.16

12. *The 1938 Seedlings*, which are being basketed at the time of writing, will be discussed in the next report.

13. *Canes introduced* during the year, *via* the Central Quarantine Station, Trinidad, were :—

B. 3172, B. 3259, B. 34104, B. 34105, B. 34106, B. 34117, B. 34120, B. 34129, B. 34130, B. 34134, B. 34137, B. 34163.

Experiments Reaped.

14. *Variety Trials.*—At the time this series of experiments was initiated, D. 625 was the standard cane of the Colony and its yield was taken at 100 in assessing the value of other varieties under test. The experiments having shown up the definite superiority of P.O.J. 2878 and Diamond 10 to D. 625, the two former have been rapidly extended and new plantings of D. 625 are no longer made. Since both the experimental data and large scale commercial returns indicate that P.O.J. 2878 is, in general, a higher yielder than Diamond 10, it has been decided to use P.O.J. 2878 in future as the standard for comparing new varieties.

15. Of the sixty-three variety trials reaped during the year, twenty-nine were fully reported on in *Sugar Bulletin* No. 7. The results of the remainder have been printed and distributed locally, and summarised in *The Agricultural Journal of British Guiana*, Vol. X., No. 1. Since they will again appear and be discussed in *Sugar Bulletin* No. 8 (to be published before this report) they will not be dealt with here.

16. *Manurial Trials.*—Two out of the twenty-one manurial trials reaped during the year have been dealt with in *Sugar Bulletin* No. 7. Those interested locally are already in possession of the results of the remainder and as these are to be fully

covered in *Sugar Bulletin* No. 8, appearing before this Report is printed, they will not be further discussed here.

17. *Flood-fallowing Trials.*—Three trials of this type were reaped during the year. Two have already been fully discussed in *Sugar Bulletin* No. 7. In the other, which will be dealt with in *Sugar Bulletin* No. 8, treatments had no significant effect on cane yield or quality.

18. *Irrigation-Manurial Trials.*—Four of these have now been reaped as plant canes and first ratoons. The results will be detailed in a contribution to *The Agricultural Journal of British Guiana, Vol. X, No. 4.*

19. *A comparison of double versus single planting of P.O.J. 2878* was reported on during the year. The experiment was carried out on acid silt frontland overlying an alkaline silt subsoil and it was found in the plant canes that :—

1. Double planting produced significantly more shoots per acre in the first five weeks and the second five weeks, and that at harvest it yielded significantly more millable stalks.
2. Mortality was higher among the double-planted than among the single-planted population, but insufficiently so to affect the great initial advantage of the former since it used up just less than half of it.
3. Two-thirds of the first order (0-5 weeks) and a like number of the second order (6-10 weeks) shoots perished before harvest and the two groups together formed only 30 to 36 per cent. of the whole harvest.
4. Double planting, using less than two tons of extra planting material per acre, gave a significant increase of 12·9 per cent. in the yield of cane (a further advantage is a much better stand at the start and the almost total elimination of the expense of supplying blanks).
5. No significant differences were observed between the weights of cane per stalk, the sucrose contents of the cane, the juice purities or the glucose ratios from single as against double plantings, but the latter produced significantly longer late (after 10 weeks) stalks.

Experiments in Progress

20. During the year, twelve Variety, three Manurial and two Cultivation trials were started. The 49 Variety, 22 Manurial, 4 Irrigation-Manurial, 3 Flood-fallow and 2 Cultivation trials in progress are listed in Table III.

TABLE III.

LIST OF EXPERIMENTS IN PROGRESS ON DECEMBER 31, 1938.

Estate.	Field.	Kind of Experiment.	Treatments.	Replicates.	Age of Cycle.	Date Started or Reaped.	Layout.
BERBICE—							
Skeldon	119-123/80	Irrigation-Manurial	6	4	2nd Rat.	9. 8.38	Ran. Bks.
Port Mourant	2-4 P.M.L.	" "	6	4	"	24. 2.38	"
"	20 R.	Manurial	3 x 3	3	"	7. 9.38	Factorial
"	23 R.	"	3 x 3	3	"	6. 9.38	"
"	7 A.W. (a)	Variety	2	4	"	8. 9.38	Ran. Bks
"	7 A.W. (b)	"	3	4	"	8. 9.38	"
"	5 A.	"	6	5	Plants	26. 2.38	"
Albion	23 B.	Manurial	3	3	1st Rat.	8.12.38	Lat. Sq.
"	23 B.	Variety	3	5	"	8.12.38	Ran. Bks.
"	49 A.	"	3	1	2nd Rat.	25. 3.38	Prelim.
Rose Hall	6, 8, 10 T.	Irrigation-Manurial	6	4	"	8. 4.38	Ran. Bks.
"	81 R.H.	Manurial	3 x 3	3	3rd Rat.	15.11.38	Factorial
"	31 S.	"	6	6	Plants	16. 4.38	Lat. Sq.
"	F.F.A. No. 1	"	6	6	"	23. 4.38	"
"	5 C.	Variety	3	5	"	11. 2.38	Ran. Bks.
Providence	14 E.W.	"	5	5	3rd Rat.	23.11.38	Lat. Sq.
Blairmont	2 Ab.	Manurial	4	4	Plants	13. 1.38	"
"	2 Ab.	Variety	4	6	"	13. 1.38	Ran. Bks.
"	26 Rp.	Manurial	3 x 3	3	3rd Rat.	21. 9.38	Factorial
"	37 Rp.	Variety	3	5	1st Rat.	12. 4.38	Ran. Bks.
Bath	21, 20 19 D.	Irrigation-Manurial	6	4	2nd Rat.	21. 7.38	"
"	7 F.	Variety	5	5	Plants	10. 3.38	"
EAST DEMERARA—							
Cane Grove	53 M.	Manurial	5	5	4th Rat.	31. 3.38	Lat. Sq.
"	4 P.	"	3 x 3	3	2nd Rat.	31.10.38	Factorial
"	36 S.D.	"	6	6	"	8.12.38	Lat. Sq.
"	50 S.M. (b)	Variety	2	5	"	22. 4.38	Ran. Bks,
Lusignan	H.	Flood-fallow	4	4	"	26. 4.38	Lat. Sq.
"	F.	" "	4 x 2	4	1st Rat.	19.10.38	"
"	2 G.H.W.	Variety	3	5	2nd Rat.	30.11.38	Ran. Bks.
"	65 W.A.	"	5	5	Plants	10. 2.38	"
La Bonne Intention	15 F.	Manurial	3	3	1st Rat.	1.12.38	Lat. Sq.
"	15 F.	Variety	4	5	"	1.12.38	Ran. Bks.
"	38 L.R.	"	7	5	Plants	23. 6.38	"
Sophia	1 E. (a)	"	2	5	2nd Rat.	8. 3.38	"
"	4 E. (a)	"	6	5	1st Rat.	19. 8.38	"
"	4 E. (b)	"	5	5	"	22. 4.38	"
"	10 E.	"	2	7	2nd Rat.	5. 3.38	"
"	12 F. (a)	Cultivation	4	4	Plants	5. 3.38	Lat. Sq.
"	12 E. (b)	"	4	4	"	28. 5.38	"
"	13 E.	Variety	5	5	1st Rat.	1. 3.38	Ran. Bks.
"	14 E.	"	3	6	2nd Rat.	16.11.38	"
"	16 E. (a)	"	2	5	"	28.10.38	"
"	16 E. (c)	"	2	5	"	28.10.38	"
"	17 E.	"	3	4	"	24.10.38	"
"	3 W.	"	17	5	Plants	24. 6.38	"
"	4 W. (a)	"	2	5	2nd Rat.	8.11.38	"
"	4 W. (d)	"	2	5	"	8.11.38	"
"	6 W.	"	10	5	Plants	1.12.38	"
"	8 W.	"	22	5	"	15. 6.38	"
"	9 W.	"	15	5	"	16. 9.38	"
"	10 W.	"	8	5	1st Rat.	16. 8.38	"
"	11 W. (a)	"	8	5	"	24.11.38	"
"	11 W. (b)	"	5	5	"	24.11.38	"
"	13 W.	"	2	5	"	14. 3.38	"
"	14 W.	"	6	5	"	27. 7.38	"
"	16 W.	"	10	5	2nd Rat.	17.11.38	"
Diamond	119 G.D.	Manurial	3	3	1st Rat.	2. 8.38	2 Lat. Sqs.
"	119 G.D.	Variety	4	5	"	2. 8.38	Ran, Bks.
"	113 G.D.	"	7	5	Plants	16. 6.38	"
"	93 G.D.	"	3	5	2nd Rat.	10. 8.38	"
"	16 G.	"	7	5	Plants	27. 5.38	"
Providence	48 P.H.	Flood-fallow	4 x 2	4	"	...	Lat. Sq.
WEST DEMERARA—							
Versailles	34 V.S.	Manurial	3	3	1st Rat.	19.11.38	Lat. Sq.
"	34 V.S.	Variety	4	4	"	18.11.38	"
Wales	21 Gv.	Manurial	3 x 3	3	Plants	5. 2.38	Factorial
"	10 C. (a)	"	6	6	2nd Rat.	21.10.38	Lat. Sq.
"	10 C. (b)	"	6	6	"	20.10.38	"
"	39 V. (a)	Variety	2	5	"	9. 3.38	Ran. Bks.
"	39 V. (b)	"	2	5	"	9. 3.38	"
Leonora	71 P.L.	"	7	5	Plants	22. 6.38	"
"	53 Sv. (a)	"	3	5	2nd Rat.	21. 4.38	"
"	53 Sv. (b)	"	3	5	"	21. 4.38	"
"	35 C.I.	"	5	5	1st Rat.	8.11.38	Lat. Sq.
"	35 C.I.	Manurial	3	3	"	8.11.38	"
Uitvlugt	31 E.	"	3 x 3	3	2nd Rat.	13. 4.38	Factorial
"	43 E.	"	3 x 3	3	Plants	23.10.37	"
"	64 Z.	"	6	6	2nd Rat.	4.10.38	Lat. Sq.
"	69 Z.	"	6	6	"	27. 9.38	"
"	71 M.Z.	Variety	2	5	"	10.11.38	Ran. Bks.
"	46 D.W.	"	3	7	"	1. 3.38	"

21. Table IV summarises, for each variety, the number of experiments in which it occurs, and their cycle ages.

TABLE IV.

VARIETIES IN REPLICATED TESTS, DECEMBER 31, 1938.

Variety.	Number of experiments as				Total.	Variety.	Number of experiments as				Total.
	P.	1st Rat.	2nd Rat.	3rd Rat.			P.	1st Rat.	2nd Rat.	3rd Rat.	
P.O.J. 2878 ...	13	11	18	1	43	D. 83/33 ...	2	1	...	...	3
P.O.J. 2753 ...	1	1	2	...	4	D. 85/33 ...	4	2	...	...	6
Diamond 10 ...	1	4	5	1	11	D. 121/33 ...	1	1	1	...	3
Co. 213 ...	3	2	2	1	8	D. 129/33 ...	1	...	...	...	1
Co. 290 ...	1	...	...	...	1	D. 189/33 ...	1	1	...	...	2
D. 100/29 ...	...	1	...	...	1	D. 221/33 ...	3	1	...	...	4
D. 49/30 ...	4	...	2	1	7	D. 250/33 ...	3	1	...	...	4
D. 50/30 ...	...	1	4	...	5	D. 295/33 ...	...	1	...	...	1
D. 66/30 ...	...	1	4	1	6	D. 419/33 ...	1	1	1	...	3
D. 67/30 ...	1	1	1	...	3	D. 450/33 ...	3	2	...	...	5
D. 75/30 ...	4	4	4	...	12	D. 456/33 ...	7	2	...	...	9
D. 147/30 ...	2	1	3	...	6	D. 552/33 ...	1	1	...	...	2
D. 150/30 ...	2	1	1	...	4	D. 70/34 ...	2	...	...	...	2
D. 1/31 ...	...	...	1	...	1	D. 104/34 ...	2	...	...	...	2
D. 5/32 ...	...	1	...	...	1	D. 109/34 ...	1	1	...	...	2
D. 11/32 ...	2	1	...	...	3	D. 110/34 ...	3	1	...	...	4
D. 8/33 ...	...	...	1	...	1	D. 111/34 ...	1	1	...	...	2
D. 16/33 ...	1	1	...	...	2	D. 112/34 ...	1	1	...	...	2
D. 20/33 ...	2	1	...	...	3	D. 113/34 ...	1	2	...	...	3
D. 24/33 ...	3	1	2	...	6	D. 116/34 ...	1	1	...	...	2
D. 30/33 ...	...	...	1	...	1	D. 118/34 ...	2	...	...	...	2
D. 31/33 ...	4	2	1	...	7	D. 119/34 ...	...	1	...	...	1
D. 34/33 ...	1	1	1	...	3	D. 121/34 ...	2	...	...	...	2
D. 39/33 ...	5	2	2	...	9	D. 123/34 ...	2	...	...	...	2
D. 40/33 ...	1	...	2	...	3	D. 124/34 ...	2	...	...	...	2
D. 44/33 ...	2	2	...	...	4	D. 165/34 ...	1	...	...	...	1
D. 49/33 ...	...	1	...	...	1	D. 166/34 ...	2	2	...	...	4
D. 51/33 ...	3	1	...	...	4	D. 169/34 ...	2	...	...	...	2
D. 58/33 ...	1	1	...	...	2	D. 170/34 ...	2	...	...	...	2
D. 63/33 ...	1	1	...	...	2	D. 171/34 ...	3	...	...	...	3

Miscellaneous.

22. Table V gives statistics for recent years as to seedlings bred, cane cuttings distributed, field experiments started and reaped, cane samples analysed, etc.

TABLE V.

STATISTICS OF SEEDLINGS, CANE DISTRIBUTION, FIELD EXPERIMENTS, CANE, SOIL AND ROOT SAMPLES, CANE SOLD AND VISITS PAID TO ESTATES, 1929-1938.

Year.	Seedlings Basketed.	Cane Cuttings Distributed.		Field Experiments.		Cane Samples.		Soil Samples Taken.	Root Samples Taken.	Cane sold to Pln. Ogle.		No. of Days Visiting Estates.
		No. of Cuttings.	No. of Bags.	Started.	Harvested.	No. Taken and Analysed.	Cane Crushed (Tons).			Punt-loads Delivered.	Net Receipts $.	
1929 ...	6,100	119,600	920	3	7	2,200	25	50	...	63	1,099.55	18
1930 ...	9,235	259,740	1,998	17	1	36	1	62	...	54	296.09	90
1931 ...	4,240	388,700	2,990	17	17	731	16	136	...	313	1,444.56	151
1932 ...	5,290	395,720	3,044	27	34	1,134	34	112	...	542	2,974.55	185
1933 ...	18,974	174,590	1,343	30	47	2,490	52	175	1,272	599	3,635.68	259
1934 ...	24,147	39,978	307	30	58	2,425	53	400	560	380	2,767.31	197
1935 ...	19,898	486,200	3,740	34	55	2,719	59	310	...	521	3,720.52	212
1936 ...	23,210	509,600	3,920	60	71	4,804	40	258	...	534	3,378.75	258
1937 ...	23,421	333,222	2,563	28	104	4,192	46	336	...	551	3,374.39	237
1938 ...	...	221,780	1,706	17	104	3,263	34	38	...	537	3,219.35	174

Seed Distribution.

23. Selfed cane fluff of the following varieties was sent to the New South Wales Department of Agriculture:—

D. 166/34 (Parents : P.O.J. 2878 x Sorghum)
D. 3/34 (,, ,, x Co. 281)
D. 484/36 (,, ,, x Sorghum)
D. 486/36 (,, Co. 213 x ,,
D. 488/36 (,, P.O.J. 2878 x ,,
D. 456/33 (,, ,, x Diamond 10)
D. 2/35 (,, Co. 281 x D. 66/30)

Publications.

24. The following publications were issued during the year :—

"Field Experiments with Sugar Cane, VII,"
By C. H. B. Williams and C. Cameron; *Sugar Bulletin* No. 7, Department of Agriculture, British Guiana.

"The Variety and Fertiliser Position of the Sugar Industry, IV,"
By C. H. B. Williams ; *The Agricultural Journal of British Guiana*, Vol. IX., No. 2, p. 101.

"An Efficient and Compact Layout for Sugarcane Fertiliser Tests,"
By C. H. B, Williams and R. R. Follett-Smith ; Proceedings of the Sixth Congress of the International Society of Sugar Cane Technologists.

"Double versus Single Planting,"
By C. H. B. Williams and L. A. Forte ; Proceedings of the Sixth Congress of the International Society of Sugar Cane Technologists.

"The Importance and Use of Appropriate Assumed Means in Collating Field Experimental Results Statistically,"
By J. B. Bourne ; *Tropical Agriculture*, Vol. XV., No. 11, p. 247.

"Tabular Results of Field Experiments with Sugar Cane Reaped July–December, 1937."

25. The last-named publication was distributed locally to Managers of estates and others closely connected with the sugar industry. It is intended to bridge the gap of a year which separates successive issues of the Sugar Bulletin, by providing the Tables for the first half of that period as soon as possible.

26. In addition to the above, full monthly reports on the work in progress were submitted to the Director of Agriculture.

Rainfall.

27. Table VI compares the 1938 monthly rainfall at the Sophia Sugar Experiment Station with the monthly average.

TABLE VI.

1938 RAINFALL AT THE SUGAR EXPERIMENT STATION.

Month.	Actual Rainfall, 1938, in.	Average Rainfall 1921-38 in.	Excess or Deficit, in.
January	13·72	9·18	4·54
February	14·20	4·27	9·93
March	14·76	4·78	9·98
April	8·94	5·46	3·48
May	11·14	11·77	-0·63
June	12·99	14·37	-1·38
July	12·86	11.26	1·60
August	15·92	8·54	7 38
September	2·42	2 68	-0·26
October	3·37	3·95	-0·58
November	5·29	5·63	-0·34
December	7·71	14·17	-6·46
Totals	123·32	96 06	27·26

28 The total precipitation was abnormally high. The excesses were recorded mainly from January to April and again in August, and for the first eight months of the year the monthly total was never under eleven inches except in April when it was nearly nine. On the other hand the rainfall tended to be low during the last four months of the year and was markedly deficient in December.

29. The writer is very grateful to the sugar estate authorities for their co-operation whenever it was needed. He desires to thank Mr. Cameron, who acted as Sugar Agronomist in his absence, and the Staff of the Sugar Experiment Station, for their zealous assistance.

C. HOLMAN B. WILLIAMS,
Sugar Agronomist and Plant Breeder.

May 5, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE CHEMICAL DIVISION FOR THE YEAR 1938.

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REPORT ON THE CHEMICAL DIVISION FOR THE YEAR, 1938.

STAFF.

D. W. Duthie, M.A., B.Sc., Ph.D., F.I.C. —Chemist.
C. L. C. Bourne —Assistant Chemist.

SUGAR EXPERIMENT STATION LABORATORY.

2. During the year, 2,367 cane samples from variety and manurial experiments were analysed for sucrose, juice purity and glucose. These samples were taken from 104 field experiments of which 63 were variety trials and 21 were manurial experiments. These results were analysed statistically by the Laboratory Staff and will be incorporated in *Sugar Bulletin No. VIII.*

3. A new Schmidt and Haensch saccharimeter was purchased early in the year.

4. Some 40 soil samples from variety and manurial trials were analysed by the Assistant Chemist, who also prepared soil notes for *Sugar Bulletin No VII.*

SOIL ACIDITY.

5. A considerable amount of laboratory work on this subject has been carried out during the year, and the results are being prepared for publication. Two points have been studied :—the rate of increase in acidity of clay and pegasse, i.e. the buffering action of the clay as compared with pegasse ; and the relative proportions of "active" alumina in clay and pegasse at different degrees of acidity. Briefly, it has been found that the greater the acidity, the slower is the increase in acidity, which, of course is normal for a buffered solution. The amount of "active" alumina in pegasse soils is much higher than that in clay soils, and thus it is possible that aluminium toxicity has played a part in cane cultivation on pegasse soils. Further, the amount of "active" alumina increases with increasing acidity so that more of this undesirable soil component is being released as the soils increase in acidity. The success of the POJ 2878 variety on pegasse soils may thus be due to a greater tolerance for alumina, and this work will be followed by pot experiments to find the limit of tolerance for the varieties now in general use.

THE PHOSPHATE STATUS OF PADI SOILS.

6. Analysis of a large number of padi soil samples has shown a complete lack of available phosphate in the topsoil (by Truog's method), while subsoil samples have usually shown appreciable amounts. Since padi is a grain crop it was felt that phosphate might be the limiting factor in yield, particularly in Essequibo where two crops are grown per year. Experimental plots were accordingly marked off in the Georgetown Rice Station and Plantation Affiance, Essequibo, and graded dressings of superphosphate, from 1 cwt. to 50 cwt. per acre, were applied. The plots were large (about $\frac{1}{4}$ acre) so that ordinary cultivation methods could be applied, and for this reason replication of plots was not feasible. Soil samples at 6, 12, 18 and 24 inches were taken before applying the manures and after the crop had been taken off. Samples of the flooding water were also taken at intervals, and it was found that a considerable amount of the applied phosphate was in solution and thus would be lost if heavy rains necessitated drawing off some of the water. The effect of the treatments was a depression in yield, the reason for which is being investigated, and further studies of the fate of the added phosphate will be made.

RICE PARBOILING AND MILLING.

7. The Universal Milling Device, which was mentioned in the Report for 1937, has proved of great value in experimental work. Sixty varieties of padi were tested for milling qualities and the results were published in the *Agricultural Journal* (Vol. IX No. 3, 1938, p. 163). During the visit of Mr. H. Parker, Manager, Government Rice Mill, Perak, Malaya, a series of small-scale experiments was carried out in order to test points of importance in the establishment of a

central rice mill. The colour of rice for the premium market may be affected by alterations in the methods of parboiling and milling, and this is being investigated. Methods of soaking and steaming have also been examined, particularly by comparison of Malayan methods with those used in British Guiana.

FISH POISON PLANTS.

8. An unidentified variety of Haiari (*Lonchocarpus* sp.) has been sent to Rothamsted for evaluation by Dr. Tattersfield, but on the whole it seems unlikely that the Haiaris will become commercially important (see Reports of the Botanical and Chemical Divisions, 1937). The fact that *Derris elliptica* appears to grow well on the coastal clay soil makes it worthy of further investigation, and field trials are being set up when planting material is available.

TOBACCO.

9. Field and curing trials with cigarette-leaf types are being carried out by the Plant Breeder, and complementary work is being carried out on the chemical composition of local leaf compared with imported leaves. Through the courtesy of the Demerara Tobacco Co., Ltd., a number of samples of imported leaf were obtained, and these are being compared with leaf from different parts of the Colony in regard to their content of minerals, protein and nicotine. By this means it is hoped to find in what respects local leaf is inferior to the standard types used by manufacturers, and the natural sequence will be to correct these differences, if possible, by manurial trials. The two local firms, Demerara Tobacco Co. and B.G. Cigarette Factory, are co-operating in the work, and thanks are due to them for valuable assistance during the year.

CITRONELLA OIL.

10. Experimental distillations of citronella grass have been carried out in the North West District, but the quality of oil was found to be low when compared with the standards for Ceylon and Java. Cutting the grass at different stages of growth is now being tried, in order to find the age at which the best oil is obtained under the climatic conditions of that area (see also Report on North West Division).

SOIL-LESS VEGETABLE GARDENING.

11. Great interest has been aroused, particularly in the United States of America, by the recent development of vegetable growing in water or sand cultures. The extreme infertility of most diamond and gold-bearing areas of this Colony has been a deterrent to development of the interior, and application of fertilisers to the light sandy soils would be wasteful on account of losses in drainage water. The cost of transport is so high in the Potaro District onions have fetched 2/- per lb. and even the small patches of moderately fertile soil are difficult to develop because of the ravages of ants. An attempt is therefore being made to find a simple inexpensive technique for growing vegetables in sand or water culture, which could be used by gold and diamond workers, and would also be of value to householders in towns and villages where soil conditions are almost impossible for gardening.

SOIL MOISTURE AND TREE CROPS.

12. An investigation of coconut wilt on the Essequibo Coast in 1937 (see *Agriculture Journal*, B.G. 1938, p. 147) led to the suggestion that the water relationships of three crops on the coastal clays may be the limiting factor in their development. It is believed that the result of planting trees on old cane beds is that rapid run-off and good drainage prevent percolation of rain, and thus the plants are liable to suffer from drought. In collaboration with the Botanist, a bed of mango trees has been planted at the Georgetown Experiment Station after deep cultivation across the bed, in order to allow the development of roots towards the moist soil lining the drains. On the whole, fruit trees bear very poorly on the clay lands, and it is hoped that this inexpensive technique, which will be followed by soil moisture studies, will be of value to small holders. Local abnormalities of flowering and fruiting may also be associated with this problem.

SOIL EROSION.

13. The general position with regard to soil erosion was under consideration early in the year, and a joint statement for the Secretary of State for the Colonies was prepared by the Director of Agriculture, the Conservator of Forests and the Director of Public Works and Sea Defences. They conclude that the problem, in its usual aspects, is not important in this Colony, although there is some loss of surface soil in the drainage waters from sugar lands. The lay-out of the sugar estates in this Colony makes it possible to measure, quite accurately, what might be called "normal erosion," and some work on this has been carried out by the Public Works Department in collaboration with this Division. 78 samples of drainage water were analysed for solids in suspension, salts in solution, and reaction (pH), and a few of these samples were examined in more detail. It was found that sodium chloride constituted the bulk of the solids in solution.

VISIT TO THE NORTH-WEST DISTRICT.

14. The Chemist accompanied the Government Botanist on a visit of inspection to the North-West District from 25th April to 9th May. Observations were made on the soil types of the District, a distillation trial with citronella grass was carried out, and the crops, particularly citrus and cacao, were examined in relation to the soil types.

PUBLICATIONS.

15. The following papers appeared during the year :—

"The Determination of Tannins in Cacao Kernel,"
by D. W. Duthie: *Analyst* 1938, p. 27.

"Coconut Wilt in Essequibo and Pomeroon Districts,"
by D. W. Duthie: *Agrl. J. of Brit. Guiana*, 1938, p. 147.

"A Milling Test on Sixty Padi Varieties,"
by D. W. Duthie and C. L. C. Bourne; *Agr. J. of Brit. Guiana*, 1938 p. 163.

"Observations on the Biochemistry of Cacao Kernel :
I. Tannin and Catechin," by D. W. Duthie.
Seventh Ann. Rep. Cacao Research, Trinidad, p. 47.

D. W. DUTHIE,
Chemist.

February 15, 1939

DEPARTMENT OF AGRICULTURE.

REPORT ON THE ENTOMOLOGICAL DIVISION FOR THE YEAR 1938.

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REPORT ON THE ENTOMOLOGICAL DIVISION FOR THE YEAR 1938.

STAFF.

L. D. Cleare, F.R. Ent. S. —Entomologist.
C. Williams —Technical Assistant.

The Entomologist was on leave from May 6 to August 26 on full pay, from August 27 to November 3 on half pay, and on duty leave to attend the International Entomological Conference at Berlin from August 14 to 21, 1938.

PRINCIPAL CROPS.

Sugar-cane.

2. During the year there were no important outbreaks of insects affecting sugar-cane.

3. The Amazon Fly maintained its status as a parasite of the blackheaded moth borer *Diatraea saccharalis* and two examinations at the request of Plns. Ogle and Cane Grove revealed interesting figures. In the examination at Pln. Ogle in the plant field of the variety P.O.J. 2878, the parasitism of *saccharalis* rose from 12·7 per cent. to 80 per cent. in the course of a month (May 23 to June 29) while the *saccharalis* infestation fell from 58·7 per cent. to 16·7 per cent. during the same period. The *canella* infestation on the contrary rose from 7·5 per cent to 9·3 per cent. during the period. At Plantation Cane Grove, nine fields examined in June (8 plant fields, 1 ratoon) showed an infestation of 17·8 per cent. *saccharalis* and 34·0 per cent. *canella* with a *saccharalis* parasitism by Amazon Fly of 16·6 per cent. for the plant fields, while in the ratoon field there was an infestation of 8.8 per cent. *saccharalis* and 36·2 per cent. *canella* with a *saccharalis* parasitism by Amazon Fly of 7.2 per cent. It will be seen therefore that the parasite continued to maintain its position, especially its control of *Diatræa saccharalis*.

Rice.

4. There were no serious outbreaks in insect pests of rice during the year.

5. A number of samples were examined for the presence of weevils in connection with the rice grading regulations for export of rice.

Coconuts.

6. Another outbreak of the Coconut Caterpillar (*Brassolis sophorae* L.) occurred in Georgetown commencing in October, 1937, and continued to about September, 1938. A clean-up campaign was instituted and notices were served under the Plant Diseases and Pests Prevention Ordinance. In all, 226 such notices were served and palms on 628 premises were cleaned. 1,857 coconut palms and 102 cabbage palms were thus treated, but many of these it was necessary to clean a second, and even a third time. This was due principally to the fact that the owners in the first instance did not carry out the instructions given although climatic conditions were favourable to the pest also.

OTHER CROPS.

Garden and Truck Crops.

7. *Mole Crickets.*—Many enquiries were received for the control of mole crickets (*Scapteriscus didactylus* Latr.) attacking these crops. The well known bran—Paris Green bait was recommended and proved efficient in controlling thesein sects.

8. *Coushi Ants.*—Many enquiries were also received concerning the control of these insects. Carbon bisulphide has in the past proved extremely efficient for this purpose, and is the standard method recommended.

COLLECTION AND LIBRARY.

9. The work of re-arranging the collection continued during the year and satisfactory progress has been made in this direction. As usual, consignments of insects have been sent to the Imperial Institute of Entomology for determination.

10. Dr. O. W. Richards of Imperial College, London, has undertaken the examination of certain families of the *Hymenoptera*, and the first consignment was sent to him during the year through the Director of the Imperial Institute of Entomology.

11. Mr. Arthur Hall, British Museum (Natural History), London, undertook the preparation of a list of British Guiana butterflies during the year. This list, which includes some 750 species will be published, it is hoped, in the near future.

12. The Library of the Division has been maintained during the year and book cases of the sectional type constructed to accommodate some of the volumes. It is proposed from time to time to continue with this work as funds are available.

PLANT PROTECTION SERVICE.

13. Plant and seed inspection duties in connection with imports and exports were carried out as a usual part of the routine of the Division. Seeds and plants imported are examined either at the General Post Office, Customs Department or on ships on arrival in port as required.

TOURS AND VISITS.

14. The Entomologist attended the Seventh International Entomological Congress at Berlin in August as the representative of British Guiana with the British delegation.

IMPERIAL INSTITUTE OF ENTOMOLOGY.

15. The Imperial Institute of Entomology, London, again rendered considerable service to the Division in determination of collections.

PUBLICATIONS.

16. The following publications were issued during the year :—

"Status of the Amazon Fly in British Guiana." Agric. Jr. British Guiana, Vol. IX, No. 1, pp. 12-24, March, 1938.

"Plant Legislation in British Guiana and the Caribbean Colonies." *Agriculture Journal*, British Guiana, Volume IX, No. 1 pp. 25-38, March, 1938.

"A Water Rat (*Holochilus sciureus berbicensis*, Morrison-Scott) damaging Sugar-cane in British Guiana." Agric. Jr. British Guiana, Vol. IX, No. 4, pp. 216-229, pls. XIV-XVI, December, 1938.

"Damage caused to Rum Puncheons by Boring Beetles." Agri. Jr. British Guiana, Vol. IX, No. 4 pp. 237-245, 3 Tables, December, 1938.

In addition, a paper was prepared on the Amazon Fly in British Guiana and submitted to the Director of Imperial Institute of Entomology for publication.

L. D. CLEARE,
Entomologist.

February 28, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE BOTANICAL AND PATHOLOGICAL DIVISION FOR THE YEAR 1938.

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REPORT ON THE BOTANICAL AND PATHOLOGICAL DIVISION FOR THE YEAR 1938.

STAFF.

E. B. Martyn, B.A., A.I.C.T.A. ...Botanist and Plant Pathologist.
N. Persaud ...Technical Assistant.

DISEASES OF MAJOR CROPS.

No diseases of major crops requiring investigation were reported during the year.

DISEASES OF MINOR CROPS.

Bananas.

Cercospora Leaf Spot.—This continued throughout the year on the Gros Michel Bananas in the Department's experimental plots at Middlesex and Supply, and was particularly noticeable at Supply during March, when the added withering of the leaves due to attacks of secondary fungi was extremely marked. The abnormally wet year, with no "spring" dry season, favoured the disease, and made spraying very difficult, both as regards application and the most suitable time to choose for it. The general growth of the plants on both plots was however very poor, making them the more prone to disease, and it is doubtful if spraying would have been effective in any case. As it was, spraying was carried out on both plots, using 2.2.40 and 4.4.40 Bordeaux Mixture, at a rate of approximately 200 gallons per acre, and leaving a part of the plots unsprayed as a control. In neither case was any improvement noted on the sprayed plants. At the end of the year a few plants at Supply were sprayed with a sample of Perenox, using Agral as a spreader. This copper compound proved very easy to handle, but again the condition of the plants was so poor that the experiment was no criterion of the efficacy of the spray.

Panama Disease.—By the end of the year this disease had practically wiped out the Middlesex banana plot ; the looser nature of the soil probably contributing to its rapid spread compared with Supply, where on the stiff clay only 15 per cent. of the plants were affected. In both places Heavy Gas Oil was applied to the stumps and débris of affected plants after cutting them down. In this connection it is of interest to draw attention to the common practice among local farmers of interplanting bananas among a preponderance of plantains in order to lessen the contagious spread of Panama Disease.

Coffee.

Sclerotium Disease (*Sclerotium coffeicolum* Stahel). There was an unusually bad outbreak of this disease, which became especially apparent in the younger coffee cultivations on the Barima and Aruka Rivers in September. It is probable however that the abnormally wet year was mainly responsible, favouring as it does the growth of the fungus as a saprophyte on decayed vegetable matter, coupled with the fact that many of the coffee cultivations now are in a poor state of cultivation and much in need of weeding.

Citrus.

Anthracnose.—Leaves from a grapefruit tree in Berbice were sent for examination and were found affected with an anthracnose type of leaf spot, apparently due to *Colletotrichum gloeosporioides* Penz.

Tobacco.

Frog Eye.—The leaf spot caused by *Cercospora nicotianae* Ell. et Ev. is common upon all types of tobacco, but is principally confined to mature leaves at the base of the plant.

Mosaic.—This is troublesome in some cultivations. Systematic and careful roguing is the only method of defence against it when once the disease has appeared.

Tomatoes.

Mosaic.—Several bad attacks of Mosaic were reported during February, the wet weather seeming to aggravate this disease, which is common, but not usually serious. The most characteristic symptom is in the young terminal leaves, which remain in-rolled and undeveloped and tend to be chlorotic in appearance. If a young plant is attacked it never develops further, but the appearance of the disease may be delayed, sometimes until the plants are matured and have already borne normal fruit. In addition to the spindly terminal shoots, a faint chlorotic blotching appears on already open leaves.

Beans.

Mosaic.—The Sinebone Bean, (*Phaseolus vulgaris* var.) is also very liable to attack by Mosaic, which is particularly troublesome in wet weather and when the crop is grown on clay soil rather than on sand reefs. Under such conditions it often appears before flowering has taken place and no crop is obtained; sometimes however it may not affect the plants until the first pickings have been made.

FISH POISONS.

The Haiaris (*Lonchocarpus Martynii* and *L. chrysophyllus*) at Hosororo and Wauna which were originally planted under shade have now, after some 8 or 9 years growth, assumed their mature liana form, and their "bush ropes" may be seen ascending to the upper branches of the trees, attaining in some cases a thickness of over two inches.

FORESHORE VEGETATION.

Observations on the foreshore vegetation have been continued and some interesting changes noted, including the death of the Courida (*Avicennia nitida*) east of Liliendaal and of much of the *Spartina brasiliensis* west of Liliendaal. The main factor responsible has been the formation of a large sandbank to seaward of the original muddy foreshore, which is now only covered by spring tides. An unsuccessful attempt was made to establish Rhizophora seedlings on the bare mud left by the death of the Courida and Spartina. The matter is dealt with in greater detail in a note in the Agricultural Journal of British Guiana, Vol. X, No 2, p. 105.

CASSAVA TRIALS.

During the past few years a large number of Cassava varieties have been grown at the Georgetown Experiment Station for purposes of comparison and in an endeavour to sort out the many local varieties, some of which are known by different names in different districts of the Colony.*

As a step further it was decided to carry out yield trials with some of the varieties generally accepted among farmers in various districts as the best, the choice being made after consultation with the District Officers. With this end in view a random plot trial was planted at Toevlugt farm, West Bank, Demerara River, in April. Eight varieties were chosen, namely four sweet, 'London,' 'Butter Stick,' 'Chinese Stick' and 'Uncle Mac,' and four bitter, 'Sebiew,' 'Contention,' 'Fine Leaf' and 'Willie Baptiste.' Unfortunately the wet weather at the time of planting made preparation of the land difficult, and subsequently the growth was poor. The trial should however yield data as to the relative values of the varieties concerned, though not as to their normal yield under better conditions.

JENMAN HERBARIUM.

The routine work of the Herbarium was carried out, and the remounting of specimens continued. A small collection of plants made by a member of the British Guiana Boundary Commission was received by the Herbarium and despatched to Kew for determination, duplicates of most of the specimens being retained. The usual collections of seed were made, to supply as far as possible the desiderata of various correspondents and institutions.

E. B. MARTYN,
Botanist and Plant Pathologist.

February 17, 1939.

* (Ref. Report on Botanical and Mycological Division, 1935. Divisional Reports of Dept. of Agric. for 1935 p. 92).

DEPARTMENT OF AGRICULTURE.

REPORT ON THE VETERINARY DIVISION FOR THE YEAR 1938.

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REPORT ON LIVESTOCK AND VETERINARY DIVISION FOR THE YEAR ENDING 1938.

GENERAL.

1. Major T. Bone, O.B.E., M.R.C.V.S., Government Veterinary Surgeon, was granted six months' vacation leave and left the Colony in May prior to retiring from the service.

2. Mr. H. A. Fraser B.V.Sc., was appointed to act as Government Veterinary Surgeon.

3. More interest has been taken in livestock in general due no doubt to better prices obtained throughout the year.

4. Routine visits were made to the Police troop horses, abattoir and breeding out-stations.

5. The rainfall for the year was very high, 117·44 inches. During the first 8 months 99·90 inches rain fell. The pastures were flooded and the mortality among young stock was high.

GOVERNMENT STOCK FARM, GEORGETOWN.

Cattle.

6. Early in the year a shipment of pure-bred cattle arrived from England for the farm, consisting of :—

4 Red Poll bulls
3 Red Poll heifers.
2 Hereford bulls.
3 Hereford heifers.

7. Unfortunately one Red Poll bull and a Hereford heifer died on the day of arrival.

8. Four more creole cows and heifers were purchased locally for the foundation herd for breeding to Red Poll and Hereford bulls.

9. Three half-bred Red Poll calves ($\frac{1}{2}$ Red Poll and $\frac{1}{2}$ Creole) were born, they are polled and red in colour and the coat is short like the creole type.

10. The pure-bred Holstein-Friesian herd consist of 2 cows (in calf), 2 heifers and 3 bulls.

11. 3 Holstein-Friesian bulls and 3 Guernsey bulls are held for service at the Farm.

12. The number of cows served was 461, chiefly owned by small peasant dairymen supplying milk to the city.

13. Sale at auction of 5 grade Holstein heifers averaged $48 per head.

Poultry.

14. Two pens of Rhode Island Reds and Leghorns were imported from British Columbia through the Canadian Department of Agriculture, and one pen of Rhode Island Reds from England.

15. Two breeding pens were made up from the progency of Barred Plymouth Rocks imported from Canada in 1937.

16. The 1938-39 breeding season was opened in October, and both incubators were kept filled with eggs.

17. The following show the averages of three incubations of eggs :—

Fertility 93 per cent.
Hatchability 72 per cent.
Embryo mortality 14 per cent. (during the last 3 days of incubation).

18. Trap nest records were carefully kept, and all low producing birds were culled.

19. An outbreak of pox early in the year lowered production considerably.

20. The production of eggs for the year was 5,519.

21. 32 birds were sold for breeding purposes, and one pen sent to Leguan breeding station.

Pigs.

22. The Canadian Berkshire breed continues to give satisfactory results under local conditions.

23. The sows gave two litters during the year with an average litter size of 8 piglets.

24. The weight of weanlings at 8 weeks old averaged 41 lb.

25. 78 pigs were sold to farmers for improving the breed.

26. One dry sow accidentally fractured her hip and had to be sold to the butcher.

Donkeys.

27. A half-bred colt was born in February for the Kentucky jack who is now 18 years old and needs replacing.

28. The number of services was 31.

Agistment Area.

29. A small agistment area was started for the cows of farmers in far off districts desirous of breeding their animals to Red Poll and Hereford bulls.

30. The area needs enlarging to prove of real value for this purpose, although rotational grazing is practised and the animals are moved as soon as the pasture begins to fail.

FORAGE PLANTS AND GRASSES.

31. A quantity of cuttings of *Indigofera endecaphylla* and Guatemala grass have been supplied to live stock owners, but the demand is not great.

BREEDING STATIONS.

32. A new breeding station was opened at Whim, Corentyne. A bull pen, exercising paddock and a large cow paddock were built.

33. The Red Poll bull "Knepp Pundit" was held for service, and farmers are bringing their cows to be served.

34. The Leguan breeding station continues to have a Guernsey bull and 2 pens of poultry.

35. The Kitty breeding station has proved of real service to the district. The Holstein-Friesian bull "Governor Bill" has thrown some exceedingly good type grade calves.

36. At the La Belle Alliance agistment area, Essequebo, the whole compound was cleared of bush and the work of erecting the bull pens, barn and two cottages was finished in December. Fencing and road work are progressing so that bulls can be sent up as early as possible next year.

REVENUE.

37. The sale of stock, eggs and stud fees gave a revenue of $1,124.37 as follows :—

Cattle	6	...	... $330.82
Pigs	78	...	... 396.55
Poultry	32	...	... 48.90
Ducks	15	...	... 8.03
Eggs	4,737	...	... 113.15
Service Fees		...	... 176.40
Miscellaneous		...	... 50 52
			$1,124.37

ANIMAL HEALTH.

38. There was much sickness among horses and cattle due to the prolonged rainfall throughout the year.

Anthrax.

39. Two outbreaks were reported in different areas on the east coast of Berbice.

40. The areas were proclaimed and the necessary preventive measures were carried out: all contact animals as far as possible were vaccinated. Livestock owners were, however, somewhat tardy in presenting their animals for inoculation and thus hindered effectual control measures. The restrictions were removed in September.

Tuberculosis

41. A report was made by the Veterinary Surgeon attached to the sugar estates of infection among a herd of dairy cattle. The tuberculin test was applied and all reactors slaughtered.

42. Very few herds are tested for tuberculosis and a start should now be made on all dairies near Georgetown where grade herds supply milk to the city.

Hæmorrhagic Septicemia.

43. A report of an outbreak of disease among cattle on the Island of Wakenaam was investigated.

44. Post mortems were made on carcases, and clinical examinations of several animals. Bacteriological examination of tissue and blood showed organisms resembling the Pasteurella group.

45. Restriction of the movement of infected animals and proper disposal of carcases helped in controlling the outbreak.

Coryza and Pneumonia.

46. Reports of many deaths among cattle and horses on the Corentyne were investigated.

47. Many of the animals examined had coughs and colds, and were in poor condition from lack of grazing in the flooded pastures of the area.

Mastitis.

48. Eight cases were seen in three herds of dairy cattle. This disease seems to be on the increase and necessitates prompt action being taken to prevent its spread.

Parasitic Diseases.

49. Intestinal Helminths were responsible for a number of deaths among sheep. Monthly treatments with a solution of Copper Sulphate and mustard were advised and where carried out owners reported gratifying results.

Kidney Worm of Swine.

50. The incidence of this parasite among pigs is remarkably high as observed in the abattoirs.

ANIMAL HUSBANDRY.

51. The general outlook for livestock has been much improved due to the increase in price paid to producers.

52. There is a scarcity of good breeding bulls for beef herds in particular throughout the coastland, and livestock owners are enquiring for grade bulls for their herds.

53. Due to the exceedingly high price of imported pure bred bulls, the small stock owner who owns the majority of stock on the coastlands is unable to purchase bulls.

54. The Department of Agriculture—with a few exceptions, the sole importer and breeder of pure bred livestock on a small scale—have this year imported stock for improving the beef herd. The present size of the Farm is too small and is unable therefore, to be of real service to stock owners in producing a reasonable number of grade beef bulls for sale for herd improvement.

55. The extension to adjoining land and the purchase of a sufficient number of selected creole cows for grading purposes, are two fundamental necessities that should be done as early as possible, if livestock improvement is to make any material progress in the near future.

Dairy Cattle.

56. There was a good demand for dairy stock and reasonable prices are paid for young grade Holstein cows in calf.

57. The Holstein breed has given very satisfactory results in the grading up of local dairy cows, by increased milk yield, quicker growth and hardiness.

58. The services of the Guernsey bulls within the last 2–3 years have been in greater demand, due principally to the higher butter fat content of the milk of this breed.

59. It would appear however that the grade Guernsey is not as hardy as the grade Holstein particularly where conditions for growth and development are somewhat poor.

Beef Cattle.

60. The importation of Red Poll and Hereford cattle early in the year initiates a programme for the improvement of the beef herds of the colony.

61. A small herd of pure bred animals and a grade herd of each of these breeds will be kept at the Government Stock Farm for the production of breeding stock.

62. The Red Poll, a dual purpose breed, will be used in districts with a limited market for milk, and a sufficiency of cheap pastures for rearing the male animals for the block.

63. These conditions occur almost wholly throughout the county of Essequibo and thus the first large scale experiment of grading up peasant cattle with Red Poll and Hereford bulls, has been undertaken at the Government agistment area at La Belle Alliance.

64. It is a well known fact that cattle from Essequibo are almost always in good condition and are highly desired by local butchers in preference to animals from the other counties.

65. The desirable condition of the animals is chiefly due to adequate nutrition —the calf obtaining all the milk necessary for growth, and a sufficiency of pasture for development.

66. With a restricted market for milk and difficulties of transportation and adequate supervision, the development of a purely dairy type of animal is therefore

at present uneconomic in the county of Essequibo, but the improvement of beef type has the greater possibilities especially to people who are not fitted for the intensive application and more specialised co nditions of dairy husbandry.

67. In the other counties where milking the unimproved or creole type of cow is practised, and pastures are v ery much overstocked, there are produced as a result, numbers of inferior cattle.

68. The milk production of the creole or unimproved type of cow is on an average 400–600 lb. per lactation. The calves suffer from milk starvation, growth is poor and calf mortality high.

69. The creole cow is a mixture of many of the well known British breeds of cattle and Indian or Zebu bulls that have interbred through many generations and produced a type adapted to their environment. They are medium-sized, hardy and immune to tick fever, and with selection form good foundation stock to grade up with pure bred bulls or high grade bulls.

70. The local markets for slaughter stock show a small annual increase in the number of killings within the last 4-year period (1935-38).

71. A portion of this increase is due to the curing trade by the Demerara Meat Coy., but the poor quality of the animals used in processing cannot compete with the imported article and thus hinders to some degree the expansion of this trade.

Pigs.

72. There has been a great improvement in the type of pigs through the wider use by farmers of the Canadian Berkshire breed.

73. Although there has been a slight increase in butcher prices, there is no marked increase in the rearing of pigs.

74. Until rice and coco nut by-products are available in sufficient quantities and reasonably cheap in pri ce, improvement in the quality and quantity of pigs will be necessarily slow.

75. A much greater increase in butcher prices would need to be paid for good quality pigs which could be processed into ham and bacon and other cured products, to compete with the imported article.

Food Supply.

76, The supply of local feeding stuffs, rice, bran, broken rice, coconut meal, etc. has been below the de mand and consequently difficult to obtain throughout the year.

77. The cost of the feeds mentioned above also has been exceptionally high, which makes the feeding of concentrates a very expensive item to the farmer and retards somewhat the progress of improvement of livestock.

78. In this country where there is an abundance of carbonaceous or fattening foods such as rice and coconut, the lack of suitable factories cause an enormous loss of thousands of dollars annually in by-products, that have been proved of good feeding value to all classes of livestock.

79. The development of the livestock industry depends to a large extent on an adequate supply of reasonably cheap grain by-products.

80. *Pasture and Fodder Plants.*—The pastures of the coastland are low lying and easily swamped on which grow for the most part sedges and other aquatic grasses.

81. On the better drained areas of sugar estates, nearby villages and districts, a limited amount of pasture is available.

82. These limited and often unfenced grazing areas are very much overstocked with all classes of livestock owned by small peasant proprietors.

83. Under such conditions, growth and development are poor and large numbers of inferior animals are constantly produced.

84. Some form of control by landowners is necessary to stop the production of large numbers of inferior animals that utilise the limited grazing area

85. Fencing and paddocking would, with rotational grazing, improve the pastures, and with improved breeding bulls and selection a better type of animal could be economically produced.

86. Where very little grazing is available the cultivation of fodder plants such as Para and Guatemala grasses and the legumes *Alysicarpus vaginatus*, and *Indigofera endecaphylla* have given very satisfactory results.

Poultry.

87. Renewed interest was aroused in poultry breeding this year.

88. A Poultry Association was formed under the aegis of the Department of Agriculture.

89. Three breeding pens of Leghorns and Rhode Island Reds were imported by the Department to enlarge the poultry section.

90. The demand for pure-bred birds and hatching eggs exceeded the supply; to fill orders would need an extension of this section.

EXPORT TRADE.

91. The exports of cattle, pigs and poultry to Trinidad received a further encouragement through a larger vessel being put on the route by the Surinam Combined Navigation Company.

92. Better facilities for export are, however, needed such as, convenient pens at port of shipment to hold the cattle, and a regular schedule of arrival of the boat, as often cattle are held up for days prior to shipment.

93. The following are the exports from 1936—1938 :—

Year.		Cattle.	Pigs.	Poultry.
1936	...	95	321	—
1937	...	916	1,072	—
1938	...	1,111	941	—

H. A. FRASER,
Government Veterinary Surgeon.

15th May, 1939.

DEPARTMENT OF AGRICULTURE.

REPORT ON THE BOTANIC GARDENS FOR THE YEAR 1938.

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REPORT OF THE BOTANIC GARDENS FOR THE YEAR 1938.

STAFF.

E. B. Martyn, B.A., A.I.C.T.A.	...Superintendent, Botanic Gardens.
H. A. Cole	...Agricultural Instructor, (Horticultural Assistant).
P. O. Jackson	...Probationer (Clerical Assistant).
M. Sheriff	...Nursery Foreman.

GENERAL.

The weather during the year was marked by unusual rainfall, the distribution of which was extremely unfavourable for the Garden. There was no dry season during the early part of the year, and out of a total for the year of 119.00 inches 102.19 inches had fallen by the end of August, a rainfall for the first 8 months of the year which has only once been exceeded in the last 50 years. At the beginning of September, however, the rain ceased abruptly, and within two or three weeks ground which had been too sticky to work for months began cracking on the surface. Except for two heavy showers there was no more rain to speak of till December, and many of the parapets had to be left bare in the meantime. Only at the end of the year was good gardening weather experienced, with light showers daily.

2. A sum of $1000 was voted on the estimates for "Reconditioning By-roads in the Botanic Gardens." A quarter of this amount was allocated to the Experiment Station for the road through the station and the remainder used by the Botanic Gardens. Five heaps of earth were burnt during the year, two in the spring (despite the weather) and two in the autumn, enabling the northern Serpentine avenue, which has been out of commission for many years, to be surfaced, the majority of the Front Garden by-paths that were still in bad condition to be put in order, and the usual patching on the avenue to be carried out. Finally at the end of November another very small heap was burnt for patching during the December rains.

3. The P.W.D. made a concrete drain around the bandstand and laid a pipe to carry the water therefrom into the No. 1 lake, thus considerably facilitating the run-off of water from the bandstand roof during heavy rain. They also surfaced the observatory paths with stone and "oiled" them.

4. The following table shows the amounts expended under the votes accorded to the Botanic and other Government gardens :—

	Vote.	Expenditure.
Botanic Gardens Maintenance	$5,000	$ 4,998 89
Upkeep of Government Gardens and Ground	1,400	1,398 36
Purchase, Production and Distribution of Seeds and Plants	3,740	3,698 18
Reconditioning By-roads in the Botanic Gardens	1,000	996 11

FRONT GARDENS.

5. The weather conditions throughout the greater part of the year were most adverse for the maintenance off annuals and perennials in the parapets, the appearance of which suffered accordingly. In December however all the main avenue parapets were planted with Zinnias of different shades and those of the South road with varieties of double Balsams. Earlier in the year the Canna varieties 'Prince of Orange' and 'Gyphaete' had also been extended in the parapets.

6. The raising and levelling of the lawns in the South section in order that the motor mower may be used on them was continued, earth being obtained by removal from higher spots (the sites of old beds) and by paring the surface of the grass flats in the south-east and south-west corners of the Flower Garden. The

building out of the lawn edges in order to narrow and improve the appearance of the paths was continued. Constant trimming of the edges had in many cases worn them away to an extent that increased the width of the paths by several feet. A lawn sprinkler was obtained and proved effective during the dry weather at the end of the year. *Euphorbia serpens* and *Vandellia crustacea*, both creeping weeds, prove troublesome on the lawns.

7. *Cassia biflora*, plants of which were set out at the beginning of the year, turned out a most successful introduction, and bloomed profusely in December. The following new plants were also set out during the year. *Areca madagascariensis*, *Calyptrogyne dulcis*, *Coleospadix onionensis*, *Daemonorops grandis*, *Dendrocalamus strictus*, *Eucalyptus deglupta*, *Geonoma gracilis*, together with a plant of *Azadirachta indica*, the Indian Neem, and *Sideroxylon dulcificum*, the Miraculous Berry. Losses during the year included the specimen of *Blepharocarya involucrigera* immediately behind the bandstand, the *Cassia nodosa* on one of the lawns in the South section, and two more specimens of *Corypha elata* in the bed West of No. 1 lake. The Croton and Pink Hibiscus beds near the Chemistry laboratory were entirely cleared of their old plants which were replaced by young ones. The bed of *Hippeastrum equestre* near to these was a fine sight during the dry weather in November, when every plant was in bloom.

8. Extensions were made from the Pipe Lines in the Director's compound, to a standpipe near the entrance gate, and from behind the bandstand, to a standpipe near the aviary, and also to the small bird aviary, where a water jet was incorporated in the bird bath. Two Red Macaws were added to the Aviary.

9. Several of the wooden bridges, including the one to No. 1 island, were reconditioned and painted, and the paaling off of the edges of the lakes continued. Owing to the further extension of this latter work, the check gate to confine the manatees in one part of the lakes was moved from the Eastern end of No. 1 lake and placed at the Eastern end of No. 2 lake.

PARK LANDS.

10. The following new plants were set out on the avenue during the year : *Acacia suma*, *Actinophloeus macarthurii*, *Areca madagascariensis*, *Arikuryroba schizophyllum*, *Cassia biflora*, *C. excelsa*, *C. siamaea*, *Centrolobium paraense*, *Erythea armata*, *Jubaea spectabilis*, *Livistona mariae*, *Pithecellobium latifolium* and in the Park Lands, *Bambusa Thouarsii*, *Dendrocalamus strictus* and *Thysanolaena agrostis*. Two new aquatic introductions in the Park Lands were a plant of *Victoria Cruziana* (similar to, but much smaller than, *V. Regia*) put into a trench southeast of the Oval, and the Yellow Lotus, *Nelumbo luteum*, established in a trench in the northwest corner of the Park Lands.

11. The Bamboos bordering the Experimental Fields, and at the east end of the Park Lands, *Bambusa Arundinacea*, which were apparently all planted in 1890, have now completed their span of life, flowered, and are dying out and being removed.*

12. The Talipot Palm (*Corypha umbraculifera*) by the iron bridge began to shoot its flower spike in August and was fruiting at the end of the year. It is apparently about 30 years old. A specimen of *Albizzia stipulata* on the avenue was blown over during the year.

HEAD OFFICE GROUNDS.

These were maintained in order during the year; the heavy weather however prevented the use of the machine on the lawns until September, and these suffered accordingly. The Barleria edging in front of the office was removed and replaced first by varieties of Coleus, and later with a dark-leaved species of Alternanthera.

* The Report for 1890 refers to their planting under the name of '*Male*' Bamboo of India, *i.e.*, *Dendrocalamus strictus*, but this would appear to have been an error.

The office entrance road was resurfaced. The Public Works Department renewed most of the beams and part of the planking of the bridges leading to the Vlissengen Road.

NURSERIES.

Ornamental Section.

14. A collection of edging plants was made and set out in a bed under the Almond Trees. A new set of Dahlia varieties was planted in concrete tubs and again proved an attraction. Varieties of Achimenes, grown in pots and hanging baskets, were a successful innovation.

15. The new Rose beds were dug up again and remade. A start has been made with budding the better varieties of Roses onto briar stock. Some difficulty was experienced at first in getting briar cuttings to strike, but a number of plants were established, and budding successfully carried out just above soil level, strong green stems proving best suited. A large number of new Rose plants, some on briar stock, and others on their own roots, were obtained during the year from different nurseries, but the percentage of losses in transit was found to be rather high.

16. The root forming stimulant sold under the name Hortomone A was tested on cuttings of a number of ornamental plants including varieties of Bougainvillæa, King of Flowers (*Lagerstroemia indica*), *Rondeletia speciosa*, Brier, Patience and several other hardy Roses. The bases of the cuttings were dipped overnight in solutions of Hortomone A of strengths varying from 1 : 100 to 1 : 1000. The results however were disappointing, as only *L. indica* and the Red Bougainvillaea (var. Mrs. Butt) appeared to benefit at all from the treatment, and these are both subjects which root easily in the propagator in any case. The additional rooting obtained in these two cases appeared to be the same with a solution of strength 1 ; 400 as 1 : 100 ; more dilute solutions were not tried in this particular experiment.

17. The grafting of slow growing varieties of Hibiscus on to stock of the commoner and more vigorous varieties was tried again, and successful results obtained. The inarching method was employed, test tubes being used to supply water to the scion until union had taken place.

18. *Orchids.*—The collection was maintained in order during the year and some new plants obtained from collections made in the interior. These included *Cattleya violacea* and *Cyrtopodium cristatum.* One or more plants of 71 species flowered during the year. On several occasions, and especially in May, the number of plants flowering together made a fine display.

19. *Introductions.*—These included 2 plants of *Beaumontia grandiflora* from Porto Rico Experiment Station, which together with *Lonicera Tellemaniana* obtained from England dnring the previous year were set out to cover a small new arbor made under the Almond trees. The Lonicera however died after a few months. Porto Rico also sent us cuttings of *Gliricidia sepium* and *Vanilla planifolia* and plants of *Dendrocalamus Strictus.* Seed of *Victoria cruziana* was obtained from the New York Botanic Gardens and of *Nelumbium luteum* from Jamaica. Cuttings of a selection of Hibiscus varieties were received from the Imperial College of Tropical Agriculture. Sweet Pea varieties from Calcutta were tried, but died before blossoming. Seed of ornamentals was obtained from Kenya, Natal, Mauritius Fiji and Cuba by exchange, and cuttings of new shades of Frangipanni were obtained from Barbados. Seed and plants of ornamentals, including the white Anthurium lily, varieties of Ixora and Dracaena and some palm seed were also received from Trinidad in exchange. Seed of six species of Erythrina was received from the New York Botanic Garden and a selection of bulbs from the American Amaryllis Society of Florida.

Economic Section.

20. *Citrus.*—The heavy rains at the beginning of the year caused considerable loss to young sour orange seedlings by damping off, and eventually these had to be

raised under glass. *Euphorbia serpens*, a troublesome weed on lawns and in the vegetable garden, has also become very prevalent on the citrus nursery beds. The following table shows the distribution of Budded Citrus during the year.

TABLE I.

DISTRIBUTION OF BUDDED GRAPEFRUIT AND ORANGE DURING 1938.

	East Coast.	West Coast.	East Bank, Demerara	West Bank, Demerara	Berbice.	Essequibo	Georgetown.	Demerara River.	
Budded Grapefruit ...	14	...	2	30	60	9	49	30	194
„ Orange ...	46	2	1	72	70	61	35	185	472
„ Tangerine ...	16	...	1	15	2	...	14	...	48
	76	2	4	117	132	70	98	215	714

21. *Orchard* (*Chemistry Compound*).—The following new plants were set out in the orchard ; *Bertholletia excelsa* (Brazil Nut), *Caryocar nuciferum* (Souari Nut), *Cola acuminata* (Cola Nut), *Dialium guineense*, a pink flowered species of Sesbania from Surinam and suckers of the Hawaian Cooking Banana, including the varieties "Eleele," "Manaiula," "Maoli" and Popoulu" from the Panama Canal Zone Gardens. The eastern end of the orchard was planted with Plantains and Papaws to provide fruit for the Aviary.

22. *Mangoes.*—The usual inarching of Mangoes was carried out to supply orders and in all 109 grafted plants were basketed for disposal. During the previous year some mango seedlings had been planted with a view to patch budding them when of suitable size. It was found however that growth was very slow, so that when the plants were large enough for one or two buds to be put on successfully, the shock sustained in lifting the by now deeply rooted plants resulted in their death. Patch budding it seems could only be practised on seedlings planted in their permanent position, and even so the number of successful buds would probably be small, as the slow growth made does not give rise to the type of stock best adapted for budding of this nature.

23. It having been found at the Puerto Rico Experiment Station that a number of good mango varieties cultivated there come fairly true to seed, seeds of the following varieties were obtained early in the year ; Pico, Totofari, Bulbul Chasm, Cambodiana, Alphonse, Sandersha. The resulting seedlings were finally planted at the Experiment Station in December.

24. *Vegetable Garden.*—A start was made to give the beds of the vegetable garden, as they became vacant, a dressing of potash and super phosphate at the rate of 1 cwt each per acre, and this has already proved beneficial. Trials have been carried out with a number of beans and peas. The 'Pois vingt milles' pea, which was obtained from Martinique, proved to bear little or nothing under local conditions though making quite good vegetative growth. A number of beans obtained from Calcutta showed no improvement over varieties already in the Colony, and this criticism also applied to the only variety (Chal Kumra) that grew well out of a selection of gourds obtained from the same source. Sutton's Premier Dwarf bean was moderately satisfactory, but the Golden Wax Pod and Yorkshire Hero varieties proved unsuitable. Some new lettuce varieties were obtained from San Francisco, and two of these did fairly well, but the most satisfactory lettuce by far was Henderson's 'Mignonette.' Cabbage and cauliflower are difficult to succeed with on clay soil and very liable to damage by pests.

25. *Tree Tomato* (*Cyphomandra betacea*).—Plants of this raised from seed obtained in the previous year proved quite unsuited to the conditions in the Botanic Gardens. They could only be established in tubs, and even then were not successful.

26. *Soil-less Vegetable Growing.*—Experiments were started with the cultivation of Tomatoes in sand, with nutrient solution. (For further details see the Chemist's Report).

27. *Fish Poisons.*—The collection was maintained, and cuttings of another strain of *Derris elliptica* obtained from Trinidad. The Derris grew most promisingly on the clay and is to be extended at the Experiment Station.

28. *Tobacco Cultivation.*—Seed was obtained from the Rupununi of tobacco grown in that area. The few plants raised showed it to be a small leaved cigar type of tobacco. The flowering heads were bagged, and a further supply of seed obtained for extension.

29. *Introductions.*—These included budwood of a smooth-skinned lime obtained from Surinam, which was propagated on local stock and plants sent to the North West District; also several varieties of papaw from Mauritius. Tubers of *Dioscorea bulbifera*, the 'Baba-ou-la' Yam of Dominica, were obtained from there. Two varieties of guava (Lucknow 46 and 49) were received from Bombay. Mango varieties from Puerto Rico are referred to above, as also are the cooking bananas from Panama and various vegetables.

APPRENTICES.

30. Seven apprentices were employed at the beginning of the year, undergoing instruction at the Nursery, Sophia, the Apiary and the Experiment Station and Livestock Farm. At the end of August one boy's period of apprenticeship terminated and another left in September.

GOVERNMENT HOUSE AND PUBLIC BUILDINGS GARDENS.

31. The Garden at Government House was maintained in order, special attention being paid to the vegetable garden. A large number of papaws was planted, wherever space was available, but the growth of the majority was poor. A new fourteen inch lawn mower was obtained. At the Public Buildings two trees were blown down at the north-west corner on Christmas morning, doing some minor damage to the railings and to telephone wires. These Gardens, together with those of the Law Courts and Magistrates' Court, were maintained in order during the year.

TABLES.

32. The following tables indicate the work carried out in the nurseries and details of the revenue received :—

TABLE II.

Plants put out in the Gardens	On Parapets ...	16,815
	Shrubs, trees, etc. ...	129
Plants basketed and potted	Ornamental ...	6,608
	Economic (except citrus) ...	4,286
Plants ringed, layered and grafted ...	...	1,690
Seed sown	Ornamental (other than packets) ...	84
	Economic (other than Citrus) ...	3,978
Citrus	Seed sown ...	11,800
	Seedlings bedded out	2,465
	Seedlings budded ...	1,287
	Plants basketed ...	981

TABLE III.

PLANTS SOLD AND DISTRIBUTED DURING THE YEAR 1938.

Economic Section.		Ornamental Section.	
Budded Grapefruit:			
Marsh	194		
Budded Orange:			
Jaffa	58		
T. H. Late	36		
Navel	54		
Parson Brown	130		
Ruby	15		
Valencia	12		
West Bank	150		
Lopes	17		
Dancy	32		
Mandarin	16		
	520		
Grafted Mango:			
Bombay	3		
Ceylon	14		
Colonial Bank	5		
Mrs. Dare	11		
Divine	2		
Julie	108		
No. 11	14		
Peach	2		
Mrs. White	4		
Graham	2		
	165		
Grafted Pear:			
Rudder	48		
Pollock	42		
St. Clair	1		
River	4		
Other varieties	2		
	97		
Miscellaneous:			
Cacao seedlings	697		
Coffee ,,	4		
Nutmeg ,,	72		
Papaw ,,	607		
Other economics	1,066		
	2,446		
		Begonias	74
		Crotons	69
		Hibiscus (cuttings and plants)	1,771
		Ferns	227
		Palms	441
		Miscellaneous	1,973
		Total	4,855
		Bamboo, bundles	149

TABLE IV.

STATEMENT OF REVENUE RECEIVED FOR 1938 FROM BOTANIC GARDENS AND SALE OF GUIDE BOOKS.

Month.	Sale of Plants.	Hire of Plants.	Sale of Pots.	Sale of Bamboo.	Sale of Lilies.	Miscellaneous delivery, etc.	Sale of Guide Books.	Total.
January	$ 37 84	$ 12 96	$ 1 20	$ 1 92	$ 1 80	$ 85	$ 2 16	$ 58 73
February	18 56	1 23	48	52	2 78	...	3 36	26 93
March	26 73	...	...	1 22	3 70	60	3 94	36 19
April	19 28	...	...	1 30	2 68	52	1 56	25 34
May	22 96	96	...	1 82	4 72	60	...	31 06
June	22 73	96	1 38	1 20	3 88	40	2 16	32 71
July	23 47	...	...	88	80	44	3 72	29 31
August	80 16	3 60	06	1 62	1 86	97	2 38	90 65
September	34 62	10 24	...	1 03	4 42	...	1 32	51 63
October	49 28	...	...	2 08	3 54	...	84	55 74
November	61 09	...	1 68	1 56	2 02	70	2 04	69 09
December	53 02	...	3 12	2 74	2 68	2 70	48	64 74
	$ 449 54	$ 29 95	$ 7 92	$ 17 89	$ 34 88	$ 7 78	$ 23 96	$ 572 12

E. B. MARTYN,
Superintendent, Botanic Garden.

February 17, 1939.

SUGAR EXPERIMENT STATIONS' COMMITTEE.

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